



REPORT  
OF THE  
**DEPARTMENT OF HEALTH**  
FOR THE YEAR ENDED  
31 MARCH 1958

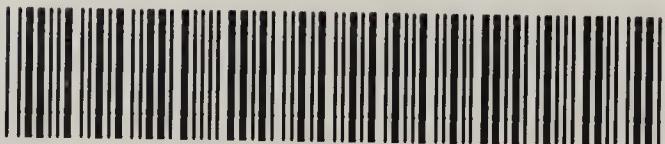
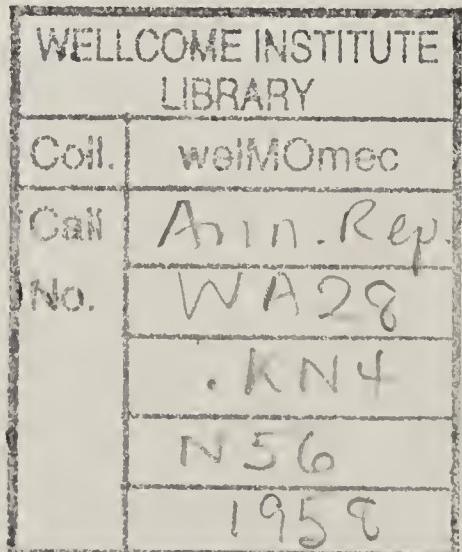
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## REPORT OF THE DIRECTOR-GENERAL OF HEALTH

The DIRECTOR-GENERAL OF HEALTH to the Hon. the MINISTER OF HEALTH, WELLINGTON.

I have the honour to lay before you the annual report of the Department for the year 1957-58.

The vital and medical statistics which appear in the report are for the calendar year 1957. On the other hand, the financial figures and, in particular, the reports of the Divisions of Hospitals and of Clinical Services, and of the Dominion X-ray and Radium Laboratory, are for the year ended 31 March 1958.

### SENIOR STAFF

During the year the following changes took place in the senior staff of the Department:

Dr L. S. Davis (formerly Director, Division of Private and Maternity Hospitals) was appointed Director, Division of Public Hygiene, in succession to Dr F. S. Maclean who retired.

Dr C. N. D. Taylor (formerly Medical Officer of Health, Palmerston North) was appointed Director, Division of Health Education and Maternal Welfare.

Dr T. L. Hayes was appointed to a newly created position of Assistant Director, Division of Clinical Services.

Dr V. S. Land (formerly Medical Superintendent of the Otaki Sanatorium) was appointed Assistant Director, Division of Hospitals, to fill an additional vacancy in the approved establishment.

It is, I think, fortunate that the organisation of the Department as set out in the Health Act allows a considerable measure of flexibility in the establishment of divisions and permits of changes being made from time to time in accordance with changing needs. As a result it has been possible, without increasing the establishment of senior medical staff, to establish a Division of Health Education and Maternal Welfare with its own director (one position as a divisional director had been vacant for a couple of years), and to transfer the responsibilities of the former Division of Private and Maternity Hospitals partly to the new division and partly to the Division of Hospitals, which now has three assistant directors instead of two. Under the new arrangement, the Division of Health Education and Maternal Welfare is responsible for the problems of maternity welfare in the broad sense, while the Division of Hospitals assumes responsibility for those aspects of private-hospital administration which are covered by the Hospitals Act.

In addition to the changes mentioned in the last paragraph, Dr Thompson's division (Clinical Services) has been strengthened by the appointment of an Assistant Director (Dr Hayes), and this appointment is already proving its worth. It will also be noted that Dr Dempster presents two reports this year, one as Director of the Division of Tuberculosis and the other as Director of Welfare Services. When Dr Dempster

was appointed Director of the Division of Tuberculosis about two years ago it was on the understanding that, in addition to his work in the field of tuberculosis, he would gradually take over more and more responsibility for other activities, especially the Department's work in connection with the care of the aged; this fact now receives official recognition by his assumption of the additional title of Director of Welfare Services.

I wish to place on record my sincere appreciation of the services of Dr Maclean, who retired from the position of Director of the Division of Public Hygiene early in the year. I have known Dr Maclean personally since he was Medical Officer of Health for the Wellington District, when I admired his ability and valued his cooperation. When I came to the Department in 1950 he had, after being the first Director of the Division of Clinical Services, already taken over the onerous and important position of Director of the Division of Public Hygiene. His management of the affairs of the division has been a model of efficiency, and our present Health Act stands as a monument not only to his meticulous accuracy but also to his profound knowledge of health administration. In his retirement he carries with him the good wishes of all his former colleagues, and I am pleased to report that he has consented to serve as a member of the reconstituted Board of Health, where his wise counsel will still be available to us.

### STATISTICAL SURVEY

The figures for live births during the year 1957 are: European, 51,852; Maori, 6,632; total, 58,484. The figures for the birth-rate per 1,000 of population are: European, 24·82; Maori, 46·29; combined, 26·20. The total number of live births shows an increase of 1,891 over the figure for the previous year; the birthrate is the highest it has been since 1948 when the figure was 26·69. The year 1947 at 27·70 remains the peak.

The maternal mortality rate (European and Maori combined) per 1,000 live births for 1957 is 0·67, compared with the previous year's figure of 0·46, which was the lowest recorded. The rate for Europeans alone is 0·58 including septic abortion and 0·54 excluding septic abortion. The actual number of maternal deaths in 1957 was 39 (European, 30; Maori, 9). One death (European) is recorded under the heading of sepsis of childbirth or the puerperium.

For some years now the maternal mortality rate has been remarkably low, and the combined rate for Europeans and Maoris has been less than one per 1,000 live births every year since 1951. Nevertheless the combined rate for 1957 is higher than it has been since 1952 (0·67 in 1957, 0·91 for 1952), and the same is true of the rate for Europeans alone (0·58 in 1957, 0·71 for 1952). In each of the years from 1953 to 1956 the number of Maori deaths has been about nine, while the number of European deaths has not exceeded 25; in 1957 the number of Maori deaths was again nine, but the number of European deaths was 30. With such small total numbers the several additional European deaths reflect themselves not only in the maternal mortality rate for Europeans but also in the combined rate for Europeans and Maoris.

The stillbirth rate per 1,000 births is 15·83 for Europeans and 15·15 for Maoris. The combined rate of 15·75 is the same as that for 1955, and these two years are now the two with the lowest stillbirth rate yet recorded.

The infant mortality rate (deaths under one year of age per 1,000 live births) is 19·98 for Europeans and 57·90 for Maoris. Until now the two years with the lowest infant mortality rate have been 1956 (European, 19·39; Maori, 54·36) and 1954 (European 19·99; Maori, 58·60); the figures for 1957 come between these two. The neo-natal death rate (deaths in the first month per 1,000 live births) is 13·89 for Europeans and 20·81 for Maoris. Both the European rate and the combined rate of 14·67 are lower than for any year except 1956, which established a new record.

### BOARDS AND COUNCILS

The Health Act 1956 reconstituted the Board of Health and widened the scope of its functions. The Board now consists of 12 members, four *ex officio* (the Minister of Health as Chairman, the Director-General of Health as Deputy Chairman, the Deputy Director-General of Health, the Director of the Division of Hospitals) and eight appointed. The members who have been appointed for the first term of three years from 1 July 1957 are Dr A. S. Wallace (a Medical Officer of Health), Sir Charles Hercus (a Member of the Faculty of Medicine at the University of Otago), Dr P. P. Lynch (a Member of the Medical Research Council), Mr H. A. Anderson (nominated by the Municipal Association), Mr A. E. Reid (nominated by the Counties Association), Mr P. V. Stainton (a member of a Hospital Board), Dr Muriel Bell, and Dr F. S. Maclean. The Board held its first meeting on 30 July 1957 and met again in December.

While the former Board of Health was principally concerned with problems of water supply and drainage, the new Board, in addition to its responsibilities in relation to local authorities and their sanitary works, is given the much wider function of making "recommendations to the Minister in respect of such matters relating to public health as may be referred to it by the Minister". Another important feature of the 1956 Act is that the Board is empowered to appoint committees, which may include persons who are not members of the Board, and to delegate any of its own powers or functions to any such committee. Among the committees already appointed are a Local Authority Affairs Committee as a standing committee to which the Board has delegated most of its powers under the sections of the Act relating to local authorities, and special committees to inquire into and report to the Board on the proper scope and future development of hospital outpatient services in relation to the general health services of the community and of public hospital psychiatric services in relation to the services administered by the Division of Mental Hygiene.

The Hospital Works Committee, which was established about four years ago as an inter-departmental committee, is given statutory existence by the Hospitals Act 1957, which comes into force on 1 April 1958. Its functions, as specified by the Act, are to make recommendations both to the Minister and to the Loans Board in respect of the major building projects of hospital boards. I regard the setting up of the Hospital Works Committee as one of the most important events in the hospital affairs of the country during the last several years, and I am pleased to report that Mr Barker (representing the Secretary to the Treasury) and Mr Wheeler (representing the Commissioner of Works), who have been my colleagues on the committee since it began, are to continue as the representatives of their respective Departments.

The Hospitals Act also makes provision for the establishment of a Hospitals Advisory Council of six members, three of whom are representatives of the Hospital Boards' Association. The necessary appointments were made during the year ended 31 March 1958 to enable the Council to hold its first meeting in April. The six members are, Mr W. E. Bate, President of the Hospital Boards' Association, Mr John Grierson, Chairman of the Auckland Hospital Board, Dr John Fulton, Chairman of the Otago Hospital Board, Mr D. Barker, representing the Secretary to the Treasury, Mr C. M. Wheeler, representing the Commissioner of Works, and myself as Chairman. Like the Board of Health, the Hospitals Advisory Council has as its principal function the making of recommendations to the Minister, but the scope of its activities is naturally confined to matters covered by the Hospitals Act.

### NEW ZEALAND REPRESENTATION ABROAD

New Zealand was represented at the Tenth General Assembly of the World Health Organisation held in Geneva during May 1957 by Dr F. S. Maclean, then Director of the Division of Public Hygiene, as chief delegate and Mr O. P. Gabites of the New Zealand Legation in Paris as alternate. Dr H. B. Turbott, Deputy Director-General of Health, represented New Zealand at the Eighth Meeting of the Western Pacific Regional Committee of the World Health Organisation held in Hong Kong during September 1957.

Dr Turbott, together with Miss F. J. Cameron, Director of the Division of Nursing, represented New Zealand at the annual meeting of the South Pacific Board of Health in Fiji during July 1957. Dr Turbott also represented New Zealand at a meeting of the Research Council of the South Pacific Commission at Noumea in June 1957. Miss Cameron represented New Zealand at the Quadrennial Congress of the International Council of Nurses in Rome during May and June 1957.

Dr J. B. Bibby, Director of the Division of Dental Hygiene, represented New Zealand at the International Dental Conference in Rome during September 1957.

### ACKNOWLEDGMENTS

The Department is again indebted to the various organisations with which it is associated for the cooperation it has received during the year.

I wish particularly to express my personal thanks to my two colleagues on the Hospital Works Committee (Mr Barker, of Treasury, and Mr Wheeler, of the Ministry of Works), as well as to the members of the various advisory and grading committees in connection with hospital salaries. It is a pleasure also to record my warm appreciation of the unfailing support and cooperation of Dr Turbott, Deputy Director-General of Health, Mr Hunn, Deputy Director-General (Administrative), Mr Galletly, who is acting for Mr Hunn during his absence overseas, the directors of all divisions, and other senior officers of the Department.

JOHN CAIRNEY,  
Director-General of Health.

## REPORT OF THE DEPUTY DIRECTOR-GENERAL (ADMINISTRATIVE)

The level of expenditure by this and other Departments concerned with physical and social welfare indicates the very substantial share of the national revenues required to maintain the community's established health and social services and benefits.

In 1955-56 departmental expenditure was £31.8 million; in 1956-57 £35.8 million; in 1957-58, now under review, £39.3 million; and future expenditure at current costs and rates of services and benefits, and with an increasing national population, must inevitably continue to rise in spite of all the efficiency which can be achieved and economies brought about by departmental administration. It is pertinent to reflect that in 1947-48 the total was £13 million. Their range and current cost highlight the problem of maintaining these benefits and services at a time when it may be difficult to maintain national income at recent levels. The distribution of the 1957-58 expenditure under main headings is shown in a diagram on page 13.

If the following table is studied it will be apparent that all but a very small proportion of expenditure arises from the cost of the benefits, services, and grants and the employment of the staffs directly providing the services, and only a small fraction stems from the essential needs of any organisation for such central services as accounting and general administration.

The figures do not include capital expenditure from Public Works Account nor, in respect of hospital Boards, loans for major capital construction raised by the boards themselves.

*Table 1*

		1956-57	1957-58	Increase
		£	£	£
Vote "Health"—				
General health services	.. ..	1,102,627	1,305,119	202,492
Dental hygiene	.. ..	758,363	845,541	87,178
Departmental hospitals and institutions (other than mental hygiene)	.. ..	479,497	497,362	17,865
Mental hygiene	.. ..	2,960,364	3,270,270	309,906
Health education	.. ..	33,324	27,539	— 5,785
Medical Research Council	.. ..	65,000	104,039	39,039
Homes for the aged	.. ..	272,842	296,849	24,007
Pensioners housing: Local authorities	.. ..	81,524	124,948	43,424
Youth hostels	.. ..	22,548	3,377	— 19,171
Plunket Society subsidies	.. ..	115,367	121,777	6,410
Miscellaneous grants and subsidies	.. ..	35,019	41,738	6,719
Bursaries	.. .. ..	39,514	43,703	4,189
Vote "Subsidies to Hospital Boards"—				
Hospital board subsidies	.. ..	12,895,674	15,390,252	2,494,578
Vote "Medical, Hospital, etc., Benefits"—				
Social Security Act: Medical, etc., benefits (includes assessed salaries)	.. ..	16,919,309	17,225,712	306,403
		<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>
		£35,780,972	£39,298,226	£3,517,254
		<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>

Of the £3½ million increase in expenditure, 70·9 per cent related to vote "Subsidies to Hospital Boards"; 8·7 per cent to vote "Medical, Hospital, etc., Benefits"; and 20·4 per cent to vote "Health". The major contributing factors to these increases were:

*Vote "Health":*

*Salaries and Wages:* Increased by £444,836. Accounted for by an increase of 391 in the total staff employed, allied with the cost for the period 19 November 1956 to 31 March 1958 of the general salary increase. Staff increases related mainly to dental and student dental nurses (129) and mental hygiene staff (204). School dental staff is being progressively increased with the aim of bringing all eligible school children under treatment at clinics. The staffing position of mental hospitals has continued to improve though there are still many vacancies.

*Poliomyelitis Vaccination:* The increase of £127,620 is almost entirely accounted for by the purchase of vaccine required for the intensive campaign to vaccinate children and other persons at risk.

*Mental Hygiene:* Salaries and wages, for the reasons mentioned above, accounted for over 80 per cent of the increased costs in running 11 mental hospitals. The balance relates mainly to bedding and clothing (£20,793) and farms and gardens (£19,311). The expenditure on farms and gardens has increased food production and has largely avoided an increase in the expenditure on rations. New villas are being opened, and this is contributing to increased maintenance costs.

*Loans, Subsidies and Grants:* £24,007 more was spent this year than last in payments to religious and welfare organisations to provide accommodation for old people. £43,424 more was paid to local authorities by way of subsidy for the erection of cottages and flats for old people. More detail is given in the report of the Director of Welfare Services.

*Medical Research Council:* The increase of £39,039 is accounted for partly by increased grants for research, and partly by an additional grant for special research into the problem of hydatids. The cost of this special research is being met one-half by Government and one-half by the three producer boards. Government has agreed to pay a total of £66,500 over a period of five years and the cost for the past year was £18,039.

*Vote "Subsidies to Hospital Boards":*

Over £15 million was paid in subsidies to hospital boards – an increase of approximately £2½ million over the previous year. It is accounted for as follows:

	£
Cessation of local body levies .. ..	660,000
Increased capital payments met from subsidy .. .. ..	460,000
Increased maintenance expenditure ..	680,000
Increased salary payments ..	700,000
	<hr/>
	£2,500,000
	<hr/>

The foregoing figures are analysed in more detail in the report of the Director, Division of Hospitals.

*Vote "Medical, Hospital etc., Benefits":*

Social security benefits under this vote increased by £285,595 to £17,058,307 – an increase of approximately 1·7 per cent compared with 8 per cent and 23·5 per cent in the two preceding years. Details of the increases are as follows:

	£
Maternity benefits .. ..	34,592
Medical benefits .. ..	130,830
Hospital benefits .. ..	60,971
Pharmaceutical benefits .. ..	106,016*
Supplementary benefits .. ..	165,218
	<hr/> <hr/> £285,595 <hr/> <hr/>

\*Decreased.

The increase is substantially less than that recorded in the previous three years. The relative costs since 1953–54 are shown in a graph on page 12.

It is particularly pleasing to record that the rising cost of pharmaceutical benefits has been halted and that the estimate for the year has been underspent by approximately £½ million. This change is dealt with in detail in the report of the Division of Clinical Services, and the Director and his staff deserve every credit for the measures they have initiated. The following table shows the growth in these benefits since 1943:

*Table 2—Pharmaceutical Benefits*

Year Ended 31 March—	Expenditure	Mean Population	Number of Prescriptions	Average Cost Per Prescription	Number of Prescriptions Per Head	Cost of Prescriptions Per Head of Population
1943 ..	£ 563,247	1,640,191	3,500,000	s. d. 3 3	2·1	£ 0 6 10
1944 ..	762,198	1,637,570	4,250,000	3 7	2·6	0 9 4
1945 ..	980,237	1,664,585	4,900,000	4 0	3·0	0 11 10
1946 ..	1,133,366	1,710,680	5,400,000	4 2½	3·2	0 13 3
1947 ..	1,439,686	1,770,291	6,100,000	4 8½	3·4	0 16 3
1948 ..	1,558,350	1,807,611	6,300,000	4 11½	3·5	0 17 3
1949 ..	1,793,159	1,843,767	6,500,000	5 6	3·5	0 19 5
1950 ..	2,043,843	1,881,317	7,240,000	5 7½	3·8	1 1 9
1951 ..	2,097,000	1,917,934	7,300,000	5 9	3·8	1 1 11
1952 ..	2,428,216	1,958,729	7,850,000	6 2¼	4·0	1 4 10
1953 ..	3,015,833	2,009,506	9,146,000	6 7	4·5	1 10 0
1954 ..	2,919,620	2,061,376	9,763,000	5 11¾	4·7	1 8 3
1955 ..	3,047,331	2,105,766	10,299,561	5 11	4·9	1 8 11
1956 ..	4,039,145	2,150,290	11,251,100	7 2	5·3	1 17 8
1957 ..	4,572,557	2,206,226	12,562,000	7 3½	5·7	2 1 11
1958 ..	4,466,541	2,232,619*	12,204,000	7 3¾	5·5	2 0 0

\* As at 31 December 1957.

### BURSARIES

The following table shows details of bursaries (1956 figures in parentheses). Increases in the values of physiotherapy bursaries were approved in 1956, and these are reflected for the first time in increased expenditure:

*Table 3—Bursaries*

		New Awards 1957	Renewals 1957	Total	Amount Paid
Dental .. ..	..	10 (8)	55 (77)	65 (85)	£ 11,448 (14,971)
Dietetic .. ..	..	6 (4)	7 (12)	13 (16)	2,071 (2,165)
Post-graduate nursing .. ..	..	7 (11)	..	7 (11)	3,464 (3,623)
Medical .. ..	..	19 (5)	25 (21)	44 (26)	7,104 (4,375)
Nursing (infant welfare training) ..	..	55 (49)	..	55 (49)	6,204 (5,508)
Nursing (midwifery, training) ..	..	2 (0)	..	2 (0)	60 (0)
Physiotherapy .. ..	..	46 (35)	56 (63)	102 (98)	13,352 (8,872)
Totals .. ..	..	145 (112)	143 (173)	288 (285)	43,703 (39,514)

### PLUNKET SOCIETY

The substantial financial assistance to the Plunket Society was continued during the year. The total of £176,690 paid was approximately £1,000 less than the previous year, the increased cost of nurses' salaries being offset by reductions in the amounts paid by way of subsidy on new capital works and subsidy in respect of donations. Payments made in the past two years are summarised as follows:

*Table 4*

		1956-57	1957-58
From vote "Health"—		£	£
Nurses' salaries .. .. .. .. ..	..	86,297	96,684
Nurses' milage .. .. .. .. ..	..	12,003	12,160
Salaries of professional, clerical staff, and travelling expenses .. ..	..	5,835	6,554
Contributions in respect of new motor cars .. ..	..	1,726	2,055
Contributions to Dominion Training Centre .. ..	..	3,000	3,000
Karitane hospitals: Subsidy on new capital works .. ..	..	6,506	1,324
Totals .. .. .. .. ..	..	115,367	121,777
From vote "Social Security"—			
Hospital benefits .. .. .. .. ..	..	42,583	43,400
£2 for £3 subsidy in respect of donations to hospitals .. ..	..	19,729	11,513
Totals .. .. .. .. ..	..	62,312	54,913
Grand totals .. .. .. .. ..	..	£177,679	£176,690

### GENERAL

The Department is a very large organisation, and no less than in large-scale private enterprise it is essential that constant and active checks be made to ensure that the organisation functions efficiently and that the systems and procedures under which it works are as efficient as can be devised. Inspections and investigations of administrative procedures and systems both in respect of departmental and hospital board activities have given cumulative results in improving efficiency and reducing expenditure,

and the pending appointment of a departmental officer for organisation and methods will enable specific investigations to be made on a number of projects which wait his attention.

Supervision and control to ensure maximum efficiency are the continuing responsibility of all controlling officers, and it is a measure of overall departmental efforts that one can report improvements and economies widespread throughout the organisation. These range from the major saving of £500,000 on estimated expenditure on pharmaceutical benefits from the measures initiated by the Director of Clinical Services Division and his staff to the extension of mechanisation of General Medical Service refund warrants, the production of a device for use by the smaller clinics in the poliomyelitis vaccination campaign for cleaning and sterilising needles, and many minor improvements which cumulatively and over a period have significant effects upon output and efficiency.

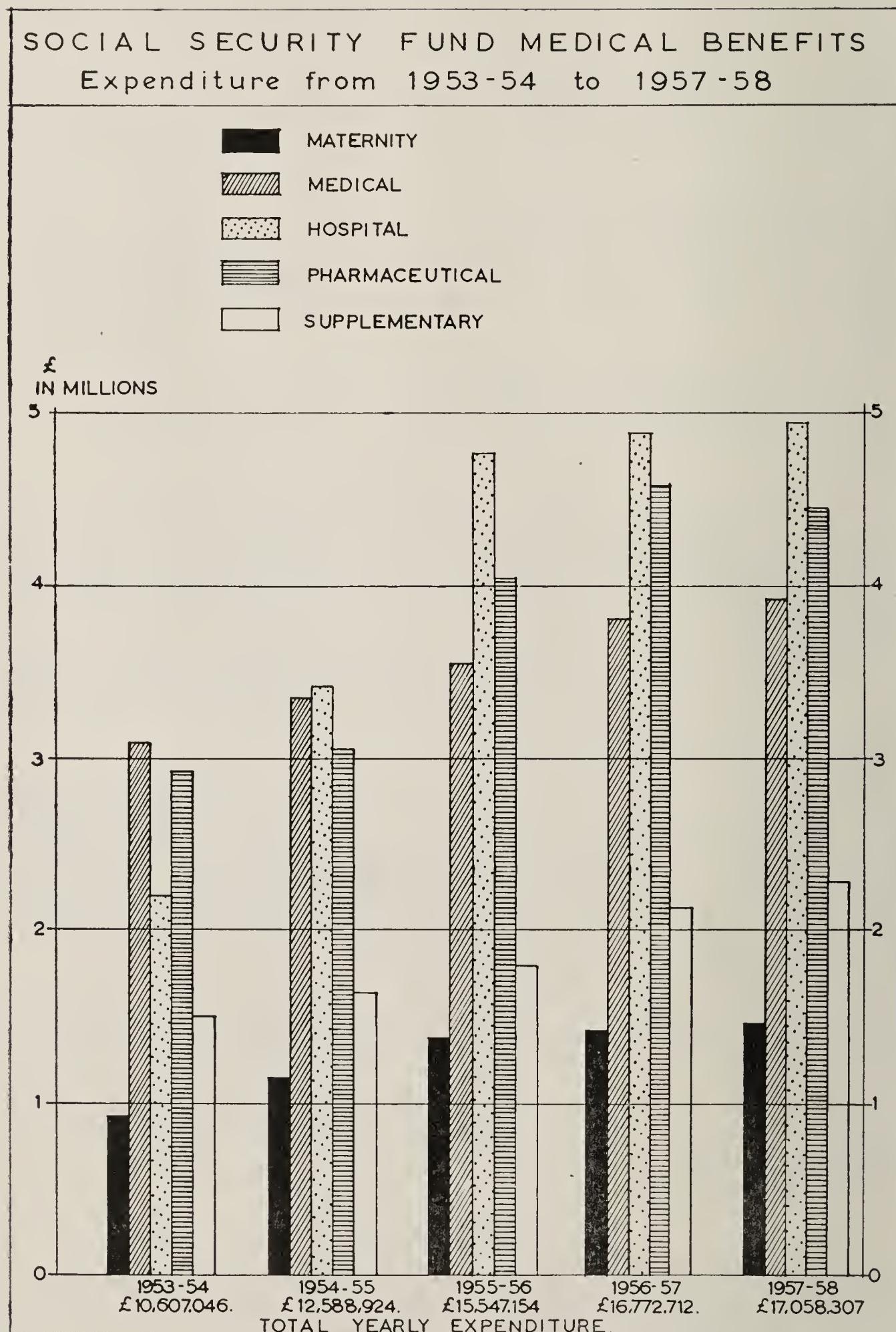
The increased number of young people leaving school this year resulted in a general improvement in recruitment, and this was noticeable in the public hospital service, in mental hospitals, in the dental service, and in administration staffing. We have suffered severely post-war from the shortage of good male recruits for administration, but it may now be that more young men of good education and potential will be attracted to make an administrative career in the Department. It would take a number of years for these to be trained and fill our existing gaps, but these gaps provide the opportunity for young men to develop with early responsibility.

The work of the professional, technical, and administrative staffs of this Department is closely interwoven, and the efficient conduct of the Department's many complex tasks throughout New Zealand reflects the close collaboration of all the staff.

During the year, the Deputy Director-General (Administrative) Mr D. A. Hunn, was awarded a Fellowship by the World Health Organisation and left New Zealand early in January for study of Public Health Administration in the United States, the United Kingdom, and Europe until August or September. The award of this Fellowship is a tribute to the personal abilities of Mr Hunn himself, and to the standing in which New Zealand is held in the World Health Organisation.

On his, and my own, behalf I express my thanks to the staff at all levels for their work and cooperation during the year.

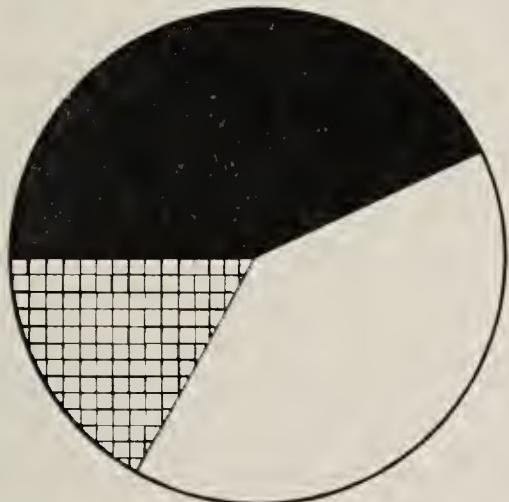
A. E. GALLETTY,  
for Deputy Director-General (Administrative).



DEPARTMENT OF HEALTH  
NET. EXPENDITURE 1957 - 1958.

TOTAL EXPENDITURE £ 39,298,226.

100%



SOCIAL SECURITY

MEDICAL, HOSPITALS etc.  
BENEFITS £ 17,225,712. 43%

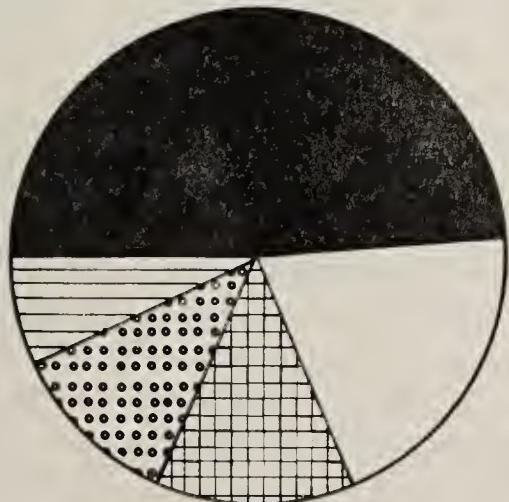
HOSPITAL BOARD  
SUBSIDIES £ 15,390,252. 40%

VOTE HEALTH £ 6,682,262. 17%

VOTE - HEALTH

£ 6,682,262.

100%



MENTAL HYGIENE.

£ 3,270,270. 49%

GENERAL HEALTH SERVICES  
& ADMINISTRATION £ 1,332,658. 20%

DENTAL HYGIENE £ 845,541. 13%

LOANS SUBSIDIES & GRANTS £ 736,431. 11%

DEPARTMENTAL INSTITUTIONS\*  
£ 497,362. 7%

\* These Institutions include: Queen Mary Hospital, Hanmer. Queen Elizabeth Hospital, Rotorua. St Helens Hospitals, Auckland, Wellington, Christchurch.

## REPORT OF THE DIRECTOR, DIVISION OF PUBLIC HYGIENE

This is my first report as Director, Division of Public Hygiene, and with it I enclose the first report of the Assistant Director of the Division, Dr D. P. Kennedy, who administers Occupational Hygiene, Poisons and Dangerous Drugs, and Air Pollution.

### INFECTIOUS DISEASES

#### Influenza

The outstanding event of public health importance in 1957 was the epidemic of "Asian" influenza which was in evidence definitely in the beginning of August, although without doubt a number of cases occurred in July or even earlier. The epidemic was part of a world wide pandemic which originated in China in February, the virus being isolated in Peking in March. Cases occurred in Hong Kong in the middle of April and reports reached WHO on 4 May from Singapore where it spread from Hong Kong. The virus was isolated in Singapore and shown to be of type A and later proved to be of a strain previously unknown. During May, June, and July the pandemic had spread to the whole of South-East Asia, the Middle East, and the Western Pacific. It reached Australia in May and by September had spread practically throughout the whole world. WHO kept us well informed as to the spread of the disease and its nature. From the first it was reported to be mild with few complications and few deaths, but the spread was very rapid and in some countries the epidemic spent itself in about two or three months.

In New Zealand three cases arrived by plane from Malaya towards the end of May, and another from Japan late in June. These cases were isolated in hospital, and as far as we were able to ascertain no secondary cases occurred as a result. However, it was soon obvious that many people were arriving in New Zealand either suffering from the disease in a mild undiagnosable form or during the incubation period, and also towards the end of July it was becoming increasingly difficult to accommodate frank cases arriving by plane or ship. The Medical Officer of Health, Auckland, reported a steady build-up of influenza-like cases during June and July and by the first week in August a widespread epidemic with a peak of an estimated 29,000 cases during the third week of August. In the first week of September this had been reduced to an estimated 2,000 cases and the epidemic was virtually over by the middle of that month. During the two months of the epidemic it was estimated that there were 90,000 cases – about one-third of the population. Wellington had much the same experience with a build-up of cases in July and a widespread epidemic during the first week in August. Several cases were verified as due to Asian influenza during the second week of August. In Wellington the epidemic was virtually over by the end of September, though sporadic cases continued to occur for some time. It was estimated that one-third of the population of the Wellington district was affected.

By the end of August the disease had spread throughout the whole of the North Island. Christchurch was affected by the middle of August and soon the whole of the South Island. The epidemic was virtually over in New Zealand by the end of October. Each district was more or less

equally affected and the mortality figures verified this finding. As the disease is not notifiable in this country it is impossible to give an accurate estimate of the number of cases, but in both Auckland and Wellington it was estimated that one-third of the population was affected, and on this basis there would be approximately 700,000 cases in the whole of New Zealand. The disease continued mild throughout the epidemic, although a few cases were very severely affected and deaths all told were by no means negligible – 179 being reported as due to this cause. This represents a mortality rate of 1 in every 4,000 infections. As this rate has been variously reported from overseas from 1 in 2,000 to 1 in 10,000 cases, New Zealand cannot be said to have escaped lightly. However, in noting this figure of 179 deaths it should be recognised that in the previous year 86 deaths from influenza occurred, 28 in 1955 and 80 in 1954. Deaths were mainly due to staphylococcal complications and affected mostly infants and old people. There were 28 deaths in infants under one year and 94 in people over 60 years of age; less than one-third of the deaths occurred between the ages of one to 60 years.

### Control

It has been recognised by public health authorities for many years that there are no effective measures against the spread of influenza. It was never hoped, therefore, that we could possibly prevent the spread of influenza into this country. Port health officers were, however, alerted and all cases arriving in this country were isolated in hospital. All contacts were asked to report to the Medical Officer of Health if they developed influenza or any similar illness. By this measure it was at least hoped that entrance of the disease into this country might be delayed until the warmer weather and we were fortunate that the warm weather did arrive before the epidemic got under way.

### Vaccination

Vaccine was procured from Australia but our supplies were always too little or too late and for the most part had to be given when the disease was upon us. At first it was used to vaccinate port health officers, ambulance drivers, and staffs of isolation hospitals; later the staffs of maternity hospitals and then general hospitals. The vaccine arrived too late for control observations to be made as it had to be given when the disease was already present, and so a number of vaccinated persons were infected by the disease before the vaccine had time to be effective. Nowhere was it reported as being anything like 100 per cent effective, but some districts reported that the disease was definitely less in vaccinated groups than in unvaccinated groups. Experience overseas has been somewhat similar to ours, but in America, where very extensive trials have been carried out, it is claimed that at least 66 per cent less cases occurred in vaccinated groups to what occurred in the unvaccinated groups. The hope is entertained that a vaccine may be produced which may be of some value in preventing the spread of a future epidemic, at least in those countries which have sufficient warning.

### Outlook

Since the influenza virus was discovered in 1933 there have been three definite changes in the type; that is, in 1934, 1947, and 1957. Each type has been entirely different from the previous one and each has quickly

replaced the previous strain and been responsible for periodic epidemics every two or three years during the 10 years or so that that type has held the field. The Asian strain will probably be with us for the next 10 years or so and will, if it follows the pattern of its predecessors, produce epidemics of varying severity each two or three years. From observations made in Holland, later confirmed in Australia and America, it would seem that the Asian strain bears a strong resemblance to the strain which caused the 1889 epidemic as it has been shown that persons over the age of 70 years possess antibodies against this new strain. This view has had varying support and the counter-suggestion has been put forward that oft-repeated experiences with an influenza virus which had some slight resemblance to the most recent strain would produce the same effect, and that we would expect this to be more in evidence in old people. The main comfort in the first view is that we are dealing now with a virus which in no way resembles the 1918 experience and supports the view that the 1918 influenza was an isolated experience, brought about not only by the mutation of a virus but a combination of other factors affecting other members of the bacteriological world. This engenders the hope that this combination of circumstances will not be repeated and that this new virus will be more orthodox in its behaviour. This is not meant to be prophetic but merely an endeavour to gather a ray of hope from the facts as we see them.

### Poliomyelitis

There was no epidemic of poliomyelitis during the year, there being only 63 cases as compared with 897 cases in 1956. Nearly all of these cases were reported in the first five months of the year, there being only 11 cases reported since May. The cases were fairly evenly distributed throughout the country, and there was no tendency for the occurrence of other than sporadic cases anywhere.

### Vaccination Against Poliomyelitis

Vaccination against poliomyelitis has progressed very satisfactorily and Table 5 sets out this programme in detail. Booster doses were given to those children of the five to nine age group who had received two injections in 1956, and further immunisation of this group proceeded with. By the end of the year over 80 per cent of the total population of children aged five to nine had received at least two injections. Vaccination of pregnant women and special groups was also proceeded with, and all told during the year 482,084 injections were given. This has imposed a heavy strain on our field staff, who have had to work long hours to cope with this extra work.

### Leprosy

One Samoan schoolboy found to be suffering from leprosy was returned home. Six cases of leprosy were reported from Auckland. One is being returned home. The others are all inactive cases occurring amongst Islanders. Fortunately we have an expert in leprosy practising in Auckland and he is able to keep these cases and their contacts under close observation. There is no danger of the disease spreading from these cases while they remain in their present state.

*Table 5—Annual Return of Poliomyelitis Vaccinations for Year Ended 31 December 1957*

District	Children			Special Groups			Pregnant Women		
	First	Second	Third	First	Second	Third	First	Second	Third
Whangarei ..	9,753	9,653	2,167	537	499	..	424	384	..
Auckland ..	31,631	31,354	7,534	1,429	1,376	..	1,349	1,298	..
Hamilton ..	19,418	19,046	4,299	795	775	301	256	231	24
Rotorua ..	14,809	14,630	2,695	728	691	..	205	175	..
Gisborne ..	12,921	12,969	2,956	1,443	1,384	121	603	553	4
New Plymouth ..	8,733	8,343	1,685	686	647	365	420	409	7
Palmerston North ..	16,515	15,975	3,363	911	879	142	442	338	..
Wellington ..	20,828	20,335	4,643	1,488	1,416	836	1,518	1,249	2
Nelson ..	7,056	6,949	1,696	554	523	262	630	561	89
Christchurch ..	22,048	21,353	4,795	720	660	..	1,115	1,061	..
Greymouth ..	4,337	4,254	888	394	365	..	230	189	..
Timaru ..	9,466	9,409	1,820	846	770	..	536	422	..
Dunedin ..	13,294	13,096	2,845	1,048	956	..	1,023	920	..
Invercargill ..	9,243	9,065	1,812	362	330	6	251	240	..
Totals ..	200,052	196,431	43,198	11,941	11,271	2,033	9,002	8,030	126

Total number of injections given: 482,084.

Estimated total population five to nine years: 244,560.

Percentage of children in age group who received two injections in 1957: 80 per cent (approximately).

### Infectious Hepatitis

The year 1957 was the first complete year for which figures are available, and the 1,443 cases that occurred during the year cannot be viewed without concern. There were 19 deaths. The disease has been known for centuries but the increased incidence since the war is probably the result of new strains of the virus for which we have little immunity. It is difficult to control because of the prevalence of unrecognised cases, and because the disease is most readily transmitted in the early stages before jaundice develops and clarifies the diagnosis. The carrier state also occurs in a fair proportion of cases and may persist for years. As in the case of poliomyelitis before the discovery of the vaccine, control of the disease is impracticable. It might be regarded as a very sensitive index of personal hygiene and community sanitation, but it may well be that, as in the case of poliomyelitis, our experience of the disease now may not indicate poor sanitation but that a high standard in this direction has prevented our gaining an immunity towards the disease.

### Diphtheria

The same number of cases, 31, were notified as in 1956, and this figure was up to that time a record. Again all but two cases occurred in the North Island, and most of the cases had not been immunised, which again emphasises the value of this important public health measure.

### Enteric Fevers

The number of cases of typhoid fever, 45, showed a decrease of 16 on the previous year. Thirty-five of these cases were Maoris and practically all occurred within the Auckland Province. Twenty-three of these cases were traced to four different carriers, one of whom was treated by cholecystectomy. As in previous years, the eating of shellfish from polluted sources was responsible for a number of cases.

### Bacillary Dysentery

The number of cases notified, 165, again showed a reduction on the 1956 notifications.

### Amoebic Dysentery

Only nine cases of amoebic dysentery were notified, this being the lowest figure for any year since the war.

### Hydatids

A total of 56 cases of hydatids were reported in 1957. The figure is higher than for the past three years but slightly less than that for 1953, which was 61. In conjunction with the Department of Agriculture a vigorous health education campaign has been undertaken to try and stamp out this dread disease, and this campaign has been well supported by farmers' groups, local bodies, and others. Many private individuals are to be commended for the enthusiastic manner in which they have campaigned against this disease. The ways and means of completely eradicating hydatids from the country do exist, and it can be said with confidence that if owners of dogs would dose their dogs regularly with an arecoline hydrobromide and also prevent their access to raw offal the disease would be eradicated within a very few years.

The other infectious diseases do not call for any special comment.

### Food Poisoning

A total of 384 cases of food poisoning were notified, as against 184 last year. Although an increase on the figure for the previous two years, the number is approximately average for the past 10 years or more. There is no doubt at all that many outbreaks occur without our having any knowledge of them. This is regrettable as our investigation of such outbreaks frequently bring to light faults in food handling which are remedied and so prevent further outbreaks from the same source. Food poisoning is a measure of our efficiency in food handling and is nearly always the result of carelessness or ignorance in preparing or storing food. The outbreaks described this year emphasise particularly the danger of preparing food with septic fingers, of keeping corned beef in liquor it was boiled in without proper precautions, and of storing cooked meat along with uncooked meat.

A family of nine was affected with food poisoning, the incubation period being 12 to 16 hours. The vehicle appeared to be corned beef which had been kept in the water it was cooked in for two days. Unfortunately this outbreak was reported too late for proper investigation.

A family of five suffered from typical food poisoning four hours after a meal of corned beef. This had been cooked and, after the first meal, kept for two days in the liquor it was boiled in. A specimen of the meat produced a profuse growth of *Staphylococcus aureus* and it was found that the mother had a septic finger which was probably the source of the original infection of the meat.

In a public hospital there were 45 cases of food poisoning which developed after eating meat which had been cooked on the Friday, partly eaten for the evening meal on Saturday, and again on Monday, after which cases of typical food poisoning occurred, the onset being

in the early hours of the Tuesday morning. The meat had all been eaten but swabs from two of the patients indicated that the causative organism was the *Staphylococcus aureus*.

After a dinner party of 95 adults, 90 of them developed abdominal pains and diarrhoea between 4 a.m. and 8 a.m. next day. Cooked ham was the vehicle, but although this was shown to be heavily contaminated with faecal organisms no pathogens could be found.

After a luncheon party of 65 adults, 45 developed diarrhoea. All who were affected had had meat sandwiches, the cooked meat for which had been stored in a cooler along with fresh meat. The actual causative organism was not discovered, but it would appear in this case that the responsible organism was one of the salmonella group.

An outbreak of staphylococcal food poisoning involving 27 people occurred after a jubilee dinner. The vehicle was evidently cream used in a trifle. A coagulase-positive staphylococcus was isolated from that and from the fingers of the cook who prepared the cream.

Four cases of staphylococcal food poisoning occurred four hours after a meal of "ham bones".

Eighteen nurses out of 20 who partook of a meal of hamburgers in the evening suffered from symptoms of vomiting, diarrhoea, and abdominal pains in the early hours of the morning. The responsible organism in this case was *Cl. welchii*. One other small outbreak was also reported as due to this organism.

In one case two children were infected with one of the salmonella organisms, the source for which was suspected to be cakes bought at a certain shop. The cakes were examined and shown to contain this organism and a carrier was found amongst the employees.

### Salmonellosis

There were no large outbreaks of salmonella food poisoning, but many individual infections from members of this group of organism were reported.

*Table 6A—Notifiable Diseases\* in New Zealand for the Year Ended 31 December 1957, Showing Distribution by Months*

ALL CASES (INCLUDING MAORIS)

Months	Enteric Fever		Tuber-culosis		Puer-peral Fever		Dysen-tery		Undulant Fever		Leptospirosis		Salmoneellosis		Malaria		Actinomycosis		Lethargic Encephalitis		Anchylostomiasis		Infective Hepatitis		Pemphigus Neonatorum		Leprosy		Beriberi		Totals		
	Diphtheria	Typhoid	Pulmonary	Other Forms	Cerebrospinal Meningitis	Poliomyleitis	Erysipelas	Folowing Abortion	Tetanus	Hydatids	Trachoma	Ophthalmia Neonatorum	Food Poisoning	Bacillary	Amoebic	Leptospirosis	Salmoneellosis	Malaria	Actinomycosis	Lethargic Encephalitis	Anchylostomiasis	Infective Hepatitis	Pemphigus Neonatorum	Leprosy	Beriberi	Totals							
January	3	2	1	94	12	6	12	4	1	6	3	2	19	5	2	14	1	1	1	1	1	1	1	1	1	1	1	534					
February	..	5	1	118	12	4	14	..	1	5	4	3	1	12	11	1	3	14	1	1	1	1	1	1	1	1	1	444					
March	..	1	5	128	32	2	7	..	2	5	2	3	1	10	18	31	1	1	1	1	1	1	1	1	1	1	1	1	503				
April	..	2	3	107	28	4	12	..	3	10	3	3	..	19	92	26	2	3	12	6	..	..	..	..	..	..	..	1	480				
May	..	2	1	120	16	3	7	..	3	1	4	3	5	..	6	21	9	..	2	8	6	..	..	..	..	..	..	1	369				
June	..	2	1	103	20	2	..	10	..	13	3	2	5	..	4	93	8	..	2	3	7	..	..	..	..	..	..	1	392				
July	..	1	5	137	16	10	..	4	..	13	3	2	1	6	..	13	23	..	4	7	5	..	..	..	..	..	..	1	404				
August	..	3	3	141	19	16	6	..	17	4	2	2	1	..	8	31	14	..	2	2	3	..	..	..	..	..	..	1	433				
September	..	2	5	140	29	24	..	140	..	892	5	2	1	2	..	3	3	..	7	2	..	..	..	..	..	..	1	234					
October	..	5	4	162	17	17	1	..	91	6	3	3	6	..	4	5	..	2	3	..	..	..	..	..	..	..	1	483					
November	..	5	5	149	25	7	1	..	12	4	3	3	2	..	3	2	..	4	24	3	..	..	..	..	..	..	1	454					
December	..	5	5	131	25	7	3	..	2	1	..	2	1	..	3	3	4	..	..	3	2	..	..	..	..	..	1	355					
Totals	..	31	45	4	1,530	251	102	63	1,017	65	27	13	46	33	56	9	93	384	165	9	23	78	99	2	1	2	1	7	2	6,085			
1956	..	31	61	6	1,565	241	72	897	21	48	35	11	47	23	38	10	93	184	201	13	32	143	60	6	2	4	3	1	1	4,903			
1955	..	51	51	9	1,640	277	91	703	4	68	29	10	49	32	36	12	3	198	457	18	44	74	84	10	1	1	1	1	1	1	1	1	3,953
1954	..	69	34	17	1,651	258	121	43	3	128	20	25	73	24	41	5	2	370	438	22	60	67	2	2	2	5	1	2	2	2	2	3,647	
1953	..	89	90	21	1,710	363	123	403	9	184	31	31	70	30	61	1	271	123	23	81	133	69	65	1	1	4	..	..	..	..	..	3,998	

\* Notifiable occupational diseases are shown in Table 12.

Table 6B—Notifiable Diseases in New Zealand for the Year Ended 31 December 1957, Showing Distribution by Health Districts

ALL CASES (INCLUDING MAORIS)

Districts	Typhoid	Paratyphoid	Pulmonary	Other Forms	Cerebrospinal Meningitis	Poliomyelitis	Influenza	Erysipelas	Ordinary	Followinge Abortion	Tetanus	Hydatids	Trachoma	Ophthalmia Neontorum	Leptospirosis	Salmonellosis	Malaria	Actinomycosis	Lethargic Encephalitis	Amebiasis	Infective Hepatitis	Periphigus Neontorum	Leprosy	Beriberi	Totals							
Whangarei	..	10	12	7	2	103	10	5	177	3	2	1	24	21	19	..	4	17	1	528	..	..	..	..								
Auckland	..	9	5	12	2	288	54	21	198	13	2	1	42	135	99	..	2	11	10	1,121	..	..	..	..								
Hamilton	..	3	2	2	..	172	24	10	192	2	1	1	6	20	1	2	17	5	19	..	..	..	..	801								
Rotorua	..	4	16	1	..	97	35	16	5	136	3	1	4	12	14	2	..	15	..	126	..	..	..	523								
Gisborne	..	2	..	..	..	127	21	10	6	45	4	7	..	3	1	..	3	..	..	84	..	..	..	390								
New Plymouth	..	..	..	..	..	43	9	9	7	42	2	5	..	4	5	1	1	2	..	23	..	..	..	209								
Palmerston Nth	..	1	..	..	..	81	24	8	10	42	5	2	..	3	2	..	1	1	..	124	..	..	..	350								
Wellington	..	..	..	..	..	225	28	9	12	55	1	1	..	6	6	..	8	..	..	307	..	..	..	664								
Nelson	..	..	..	..	..	23	10	..	..	190	14	8	..	2	1	..	3	..	..	107	..	..	..	229								
Christchurch	..	..	..	..	..	1	..	..	26	1	..	..	..	1	1	..	2	..	..	117	..	..	..	772								
Greymouth	..	..	..	..	..	1	..	..	25	4	1	..	..	1	1	..	1	..	..	13	..	..	..	107								
Timaru	..	..	..	..	..	1	..	..	83	11	3	2	..	1	1	..	2	..	..	5	..	..	..	69								
Dunedin	..	..	..	..	..	1	..	..	47	3	2	2	..	5	..	..	2	..	..	8	..	..	..	206								
Invercargill	..	2	..	..	..	1	..	..	41	1	..	..	..	4	..	..	5	..	..	16	..	..	..	116								
Totals	..	31	45	4	4	1,530	251	102	63	1,017	65	27	13	46	33	56	9	93	384	165	9	23	78	99	2	1	2	1,443	484	7	2	6,085

Table 6c—Notifiable Diseases in New Zealand for the Year Ended 31 December 1957, Showing Distribution by Age and Sex

H. 31

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ALL CASES (INCLUDING MAORIS)

Diseases	Under 1 Year		1 and Under 5		5 and Under 10		10 and Under 15		15 and Under 25		25 and Under 45		45 and Under 65		65 and Over		Totals	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	Total
Diphtheria ..	..	..	1	1	6	4	5	4	2	..	2	4	..	..	..	..	16	15
Enteric fever—																		31
A. Typhoid ..	..	..	1	1	2	2	3	2	..	5	4	7	8	2	3	..	21	45
B. Paratyphoid ..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..	..	3	4
Tuberculosis—																		1,530
A. Pulmonary ..	..	..	5	7	43	32	34	21	33	112	138	307	271	257	100	93	870	660
B. Other forms ..	..	..	3	17	12	15	10	5	8	7	24	26	47	43	13	7	124	127
Cerebrospinal meningitis ..	..	..	23	17	15	10	16	12	5	3	4	3	9	2	1	..	58	44
Poliomyelitis ..	..	..	1	1	4	2	5	4	2	5	7	9	5	2	8	..	36	27
Influenza ..	..	..	46	45	54	61	25	23	27	68	71	91	126	121	66	..	527	490
Erysipelas ..	..	..	1	2	..	..	1	..	4	2	2	5	8	7	15	7	27	38
Puerperal fever—																		65
A. Ordinary ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27
B. Following abortion ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
Eclampsia ..	..	..	2	2	..	2	..	5	1	4	..	4	..	3	..	2	..	46
Tetanus ..	..	..	..	..	..	..	..	..	6	2	4	2	..	..	3	2	..	9
Hydatids ..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	10	7	12	20
Trachoma ..	..	..	34	39	10	12	13	12	..	7	2	..	1	..	..	1	..	5
Ophthalmia neonatorum ..	..	..	6	7	10	12	13	12	..	..	..	..	..	..	..	..	..	93
Food poisoning ..	..	..	5	15	19	32	8	5	5	6	26	8	15	3	..	..	..	384*
Dysentery—																		384*
A. Bacillary ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	133
B. Amoebic ..	..	..	16	18	14	16	..	..	..	1	..	..	..	..	..	..	..	46
Undulant fever ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	165
Leptospirosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
Salmonellosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23
Malaria ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	78
Actinomycosis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	99
Lethargic encephalitis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46
Anchylostomiasis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Infective hepatitis ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Pemphigus neonatorum ..	..	..	1	26	27	152	144	142	123	..	..	..	..	..	..	..	..	1
Leprosy ..	..	..	301	183	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Beriberi ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2

\* Included in total are 135 cases age and sex unknown.

*Table 6D—Notifiable Diseases in New Zealand for the Year Ended 31 December 1957, Showing Distribution by Health Districts*

*Table 6E—Notifiable Diseases in New Zealand for the Year Ended 31 December 1957, Showing Distribution by Age and Sex*

MAORIS

## FOOD AND DRUGS

### Revision of Regulations

Twelve series of amendments have been made to the regulations in the period since they were consolidated in 1946 and it is hoped to undertake consolidation and revision as soon as the staffing position of the division permits. Not only do standards for the composition of some foods need revision, to control intended additives and unintended impurities, but also the labelling requirements. In particular the regulations do not deal adequately with modern developments in the packing and labelling of foods sold in the frozen state in ever-increasing volume and variety.

### Pesticide Residues on Fruit and Vegetables

The division is particularly concerned about the lack of control over the increasing use of poisonous materials in agriculture and horticulture, and there is an urgent need for a strengthening of the legislation, particularly the Food and Drug Regulations, in relation to limits for poisonous substances found on fruit or vegetables for sale. In recent years there has been a flood of new chemicals offered as commercial insecticides, or plant therapeutants, many of them sufficiently dangerous to be classified as "deadly poisons" under the poisons legislation. The division has not been alone in expressing concern that, despite recommendations from the Departments of Health and Agriculture, some of these are almost certain to be used by market gardeners and orchardists without proper regard to the likelihood of harmful residues remaining on the crop when sold. Some of these chemicals dissociate before harvesting, but others are stable and persist for a considerable period. Not all manufacturers label their products with sufficient rules for the application of their products in relation to the time of harvesting, and it has become increasingly evident that tolerances must be expressed (in parts per million) in regard to both type of chemical and type of food on which it may possibly be allowed to appear in minute amounts. Obviously in some cases no tolerance should be provided.

At present there is some control of metallic impurities under the Food and Drug Regulations 1946, but virtually no control over residues of the many organic chemicals now used. This problem is giving concern to public health authorities throughout the world, but so far most of the investigations have been carried out in the United States. As New Zealand is not in a position to carry out any extensive testing of chemicals for their toxicity or testing to ascertain residues which might be found following applications to crops at varying times before harvesting, we must be largely guided by properly supervised investigations made overseas, although our conditions (e.g., climate) may mean that field investigations would not necessarily be followed by the same results in New Zealand.

A close watch is being kept on the situation and it is hoped that before long the Department will be able to recommend to the Government the adoption in the Food and Drug Regulations of a simplified form of the tolerances expressed by the United States Federal Food and Drugs Administration, which have been designated "tolerances and exemptions for residues of pesticide chemicals".

### Milk

It is pleasing to mention the increasing availability of pasteurised milk in many smaller towns where the operation of a small treatment plant may hardly be feasible. Some during the year have received pasteurised milk in bulk for the first time and, better still, some have achieved a bottled pasteurised supply.

Milk sampling is reviewed in Table 8, and this shows that sampling has been reasonably well maintained notwithstanding the strain on the services of the Dominion Laboratory. Regarding pasteurised milk, it is interesting to note that early in the year as a result of firm bacteriological evidence of the contamination of raw milk with the organisms of undulant fever and tuberculosis, the milk companies in Christchurch decided that they would no longer distribute raw milk, on the grounds that, in the public interest, only pasteurised milk should be delivered to their customers. This progressive move was supported by the Christchurch Milk Board and pasteurised milk has now been distributed in Christchurch for a period of 12 months, and this has already had a noticeable effect on health statistics. Of those receiving pasteurised milk, no case of undulant fever has been recorded and there has already been a noticeable reduction in the number of notified cases of non-pulmonary tuberculosis. It is to be hoped that Christchurch will continue to maintain a pasteurised milk supply and so eliminate the risk of spreading disease which is inevitable with raw milk at the present time. There is still a small minority which claims that consumers should be free to choose between raw or pasteurised milk, and if raw milk was free from danger, this could be conceded. The fact is, however, that milk, one of the most vulnerable foods we use, cannot be made absolutely safe without pasteurisation.

Illustrative of the continuing action to eliminate bovine tuberculosis was that taken when a substantial proportion (61 out of 216) of a herd supplying milk for a provincial town were found to be positive reactors to the tuberculin test. The Department of Agriculture arranged for the infected cows to be culled and destroyed and the milk from the herd was pasteurised as an additional safeguard.

### Investigation of Foods Other than Milk

Sampling and resultant action with other foods and drugs is summarised in Table 7. There is a slight increase in the sampling which again is directed mainly to the categories of foods often at fault; for several years this volume of sampling has been regarded as a bare minimum. There were 28 prosecutions recommended compared with 15 in 1956, largely due to an increase in the number of occasions when butchers were detected—

- (a) Adding the preservative substance sulphur dioxide (in the form of sulphites) to fresh meat, in or on which it is prohibited; and
- (b) Adding more than the limited amount of this preservative ( $3\frac{1}{2}$  gr/lb) which is permitted in sausages.

With the sausages it is probably true that an excess of preservative stems as often as not from carelessness rather than the realisation of any need to compensate for an excess of stale meat trimmings. There are indications, however, that the butchers who give rolled beef and like cuts of fresh meat a superficial sprinkling with a sulphite powder do so wilfully rather than in ignorance or carelessness. With cool storage,

hygienic handling, and no attempt to seek a few more hours "shelf life" for so perishable a food, there is no justification for the use of a chemical preservative on fresh meat; the real purpose, however, of the addition is often that of increasing the red appearance of displayed surfaces of prepared joints, and this is just as reprehensible a practice.

The source of two cases of lead poisoning proved interesting. It was found that for making up a beverage cordial in a home, a jug of an ornamental type was used and this not being intended as a food container had a lead-glaze surface vulnerable to acid. The public generally probably does not give much thought to the fact that the safety of utensils and containers intended by the manufacturers for use with food is governed by the Food and Drug Regulations and that jugs sold as ornaments should not be used for holding drinks.

The detailed findings of a Government Analyst relating to a shipment of canned pineapple that had been insufficiently heat-treated in canning were passed to and gratefully received by the authorities in the country of origin.

*Table 7—Food and Drug Sampling, 1957*

	Total Samples	Samples Non-complying	Warnings Issued	Prosecutions Recommended
Cereals and bread .. ..	45	11	4	..
Table confections .. ..	2	..	..	..
Aerating ingredients .. ..	1	..	..	..
Invalid foods .. ..	7	7	7	..
Malt and malt extracts .. ..	5	2	..	..
Sausages .. ..	755	137	84	6
Mincemeat .. ..	549	32	25	1
Bacon and ham .. ..	117	49	2	3
Fresh meat .. ..	189	28	16	10
Other meats .. ..	127	15	8	5
Meat-pickling preparations .. ..	8	3	2	1
Fresh fish .. ..	72	..	..	..
Other fish .. ..	11	..	..	..
Eggs and egg products .. ..	19	..	..	..
Edible fats and oils .. ..	1	..	..	..
Cream .. ..	952	188	68	2
Milk shakes .. ..	771	256	100	..
Butter .. ..	195	7	3	..
Other milk products .. ..	84	12	5	..
Tea, coffee, and cocoa .. ..	8	..	..	..
Salts and spices .. ..	158	36	4	..
Sauces, vinegar, and pickles .. ..	9	1	1	..
Sweetening substances and confectionery .. ..	20	5	2	..
Ice cream .. ..	841	231	45	..
Fruit, vegetables and products .. ..	39	8	1	..
Jams and conserves .. ..	1	1	..	..
Culinary essences .. ..	5	1	..	..
Beverages (non-alcoholic) .. ..	104	9	..	..
Beverages (alcoholic) .. ..	30	3	..	..
Drugs and proprietary medicines .. ..	20	..	..	..
Colouring substances .. ..	2	..	..	..
Bottles for sterility .. ..	10	6	..	..
Totals .. ..	5,157	1,048	377	28
Seizures and destructions .. ..	87	..	..	..

*Table 8—Milk Sampling Summary for Year Ended 31 December 1957: Tests Applied and Results*

N/C = Non-complying. W = Warning. P = Prosecution recommended.

Districts	Total Samples				Fat				Solids Not Fat				Water				Reducase				Phosphatase			
	No.	N/C	W	P	No.	N/C	Per Cent N/C	No.	N/C	Per Cent N/C	No.	N/C	Per Cent N/C	No.	N/C	Per Cent N/C	No.	N/C	Per Cent N/C					
					99	162	7	1	4,979	17	0.3	4,978	16	0.3	4,978	10	0.2	4,933	44	0.9	3,358	..	..	..
Whangarei	..	4,986	99	7	1	4,979	17	0.3	4,978	16	0.3	4,978	10	0.2	4,933	44	0.9	4,358	..	..	..	..	..	
Auckland	..	1,671	108	62	14	1,656	35	2.1	1,655	44	2.6	1,635	41	2.5	1,120	24	2.1	909	..	..	..	..	..	
Hamilton	..	578	21	4	..	439	5	0.1	439	7	0.2	352	5	0.1	240	7	2.9	334	..	..	..	..	..	
Rotorua	..	429	17	14	..	328	8	2.4	328	1	0.3	328	..	..	3	3	..	134	3	..	5	..	..	
Gisborne	..	689	64	1	..	447	29	6.4	447	1	0.2	447	..	..	236	22	9.3	134	3	..	5	..	..	
New Plymouth	..	1,177	123	11	5	962	24	2.5	962	28	2.9	962	11	1.1	371	45	12.1	108	..	..	..	..	..	
Palmerston North	..	1,259	47	32	..	746	13	1.7	746	9	1.2	746	10	1.3	409	13	3.2	1	..	..	..	..	..	
Wellington	..	622	62	10	4	479	10	2.1	403	43	10.7	403	5	1.2	94	..	..	108	..	..	..	..	..	
Nelson	..	1,383	435	55	2	1,375	12	0.9	1,364	411	30.1	1,364	2	0.1	1,054	21	2.0	1,058	..	..	..	..	..	
Christchurch	..	141	34	2	1	139	6	4.3	139	30	21.6	139	1	0.7	7	..	..	12	1.1	..	..	..	..	
Greymouth	..	461	113	58	4	461	3	0.7	461	82	17.8	461	16	3.5	238	15	6.3	245	9	3.7	9	..	..	
Timaru	..	788	94	15	3	776	41	5.3	776	48	6.2	776	5	0.6	71	2	2.9	189	..	..	..	..	..	
Dunedin	..	484	74	34	..	390	13	3.3	384	42	10.9	384	22	5.7	343	2	0.6	66	..	..	3	4.6	..	
Invercargill	..	14,767	1,361	333	34	13,271	223	1.7	13,176	762	5.8	12,618	129	1.0	9,174	195	2.1	7,613	30	0.4	..	..	..	
Totals	..	14,767	1,361	333	34	13,271	223	1.7	13,176	762	5.8	12,618	129	1.0	9,174	195	2.1	7,613	30	0.4	..	..	..	

## ENVIRONMENTAL SANITATION

Environmental sanitation, although not a very dramatic section of public health, is nevertheless still of utmost importance to the community.

The provision of wholesome water supply, sewage disposal, refuse collection and disposal, vermin control, food sanitation, the proper construction of dwellings, public halls, food premises, and supervision of sanitary drainage and plumbing installations is taken for granted, and the average man in the street does not appreciate the vast amount of effort necessary on the part of public health officials to ensure the proper maintenance and expansion of these services to meet the needs of a growing community.

The responsibility for environmental sanitation standards primarily rests with local authorities, with the Department acting in an advisory and supervisory role. There are, however, a number of areas where it would be uneconomical for the local authority to employ its own health inspector, and in every such case the Department provides the service of one of its own departmental inspectors and recovers from the local authority some of the cost by way of a levy. During the year ending 31 March 1958 some 61 inspectors of health were engaged in this work for local authorities, including in some cases the additional work of building inspection, and the Department received in fees and levies the sum of £40,203.

When it is realised that in addition a far greater amount is spent by those local authorities which employ their own staff of inspectors it will be appreciated that the task of maintaining a satisfactory environment is one of considerable magnitude and a costly undertaking.

In common with other groups of technical officers, an acute shortage of qualified health inspectors has developed in recent years and it is becoming increasingly difficult to provide an adequate sanitary cover throughout New Zealand. The problems of recruitment and training are engaging the attention of the Department, but in the meantime inspectors in some areas are working under pressure. Notwithstanding staff shortages inspectors have done a good job, standards of environmental sanitation have been held at a reasonable level, and in some fields progress has been made.

### Sewerage

Although there are a number of towns in New Zealand still to be seweried, on the whole it can be said that sewerage reticulation in New Zealand is fairly well advanced. What we do lack, however, is the installation of proper sewage disposal. There are indeed very few towns in New Zealand where sewage treatment can be considered as even reasonably satisfactory. However, it is pleasing to be able to report that there is a growing awareness on the part of a great many local authorities of the need in this direction, and during the year the Local Authorities Loans Board sanctioned loans amounting to £11,000,000 for 41 sewage and water-supply schemes. One of these was for £6,500,000 and two others for £1,000,000 each. The Ministry of Works estimates that sewage treatment works at a cost of £9,000,000 will be required in New

Zealand within the next 20 years. As our population grows our defective sewage disposal will become more and more evident and unless stringent measures are adopted to improve matters we will in a few years' time qualify for the epithet recently applied to the British Isles "an emerald isle set in the sea of sewage". The worst offenders in this direction are meat works, and to a lesser degree dairy factories. The practice has for the most part been to discharge into the nearest river or on to the nearest beach, and as a consequence many of our rivers and beaches are grossly polluted. However, a Meat Works Committee and a Dairy Wastes Committee of the Pollution Advisory Council have been set up to tackle these problems, and it is hoped that in the near future we will see some improvement in this field. One meat company in the Christchurch area has solved the problem by means of a farm irrigation scheme and has not only produced a very satisfactory disposal of its effluent but also increased the sheep-carrying capacity from two to 25 sheep per acre. Although this method is not possible everywhere, it could certainly be used in a great many places throughout New Zealand. It would not only solve a difficult problem but would also bring about a saving of much valuable manure that would otherwise be lost. It has been demonstrated in a number of places that dairy wastes can be similarly and usefully disposed of and there is no doubt that land irrigation is the most satisfactory method of disposal of these wastes.

### Pollution Advisory Council

The Pollution Advisory Council continues to render valuable assistance in attempting to clean up our rivers and beaches. The Council met once during the year and gave consideration to reports previously presented on the pollution of the Waikato River and the Waimakariri River. Reports also prepared by officers of the Ministry of Works, the Marine, D.S.I.R., and Health Departments on pollution in the Hastings area and the Manawatu and Oroua Rivers were also considered and sent out to the local authorities concerned. Already a start has been made on measures to improve matters as recommended in these reports. The interdepartmental committee dealing with sewerage problems which also advises the Pollution Advisory Council on these matters has met regularly during the year and the Department acknowledges the very valuable assistance and cooperation received from Mr Lough of the Ministry of Works, Mr Hobbs of the Marine Department, and Mr Grigg the Dominion Analyst in many sewerage and water supply problems.

### Local Authority Affairs Committee – Board of Health

During the year the newly constituted Board of Health established the Local Authority Affairs Committee and to it delegated its full powers in those matters concerned with the safeguarding of public health in local authority areas.

The committee met twice in 1957 and has given its attention to such difficult problems as the Manurewa sewerage and the Bluff drainage schemes. Other matters are under consideration and the present indications are that the work of the committee will continue to increase.

## OCCUPATIONAL HEALTH

The year under review is the first during which the reorganised occupational health arrangements have functioned. The former Occupational Health Division is now part of the Public Hygiene Division. Field responsibilities are discharged by all medical officers of health. This has meant no significant change in the four major metropolitan centres but in other districts a wider and more effective medical coverage has been achieved.

The *New Zealand Industrial Nursing Bulletin* formerly published by the Division of Occupational Health has been incorporated in and published as an industrial nursing section of the *Nursing Gazette*. The supervision of industrial nursing is now entirely in the hands of the Division of Nursing in collaboration with this division.

### Industrial Health Centres

The following table sets out the attendances at each of the centres and gives the date when each centre was opened:

*Table 9—Attendances at Industrial Health Centres, 1957*

District	Centre	Year Established	Number of Workers to Whom Centre Available
Auckland .. ..	Penrose .. ..	1952	4,500
Wellington .. ..	Queen's Wharf .. ..	1954	6,000
Christchurch .. ..	Waterfront .. ..	1948	2,000
Dunedin .. ..	Woolston .. ..	1951	1,200
Dunedin .. ..	Lyttelton waterfront .. ..	1949	1,200
Dunedin .. ..	Foreshore .. ..	1952	2,381
Totals .. ..	..	..	17,281

District	Centre	Attendances		Total	Referred to	
		First	Redressings		Own Doctor	Hospital
Auckland ..	Penrose ..	3,154	5,522	8,676	86	228
	Queen's Wharf ..	8,863	6,994	15,857	1,053	583
Wellington ..	Waterfront ..	3,283	1,761	5,044	320	261
Christchurch ..	Woolston ..	1,068	404	1,472	116	15
	Lyttelton waterfront ..	2,473	2,737	5,210	464	46
Dunedin ..	Foreshore ..	966	571	1,537	113	137
Totals ..	..	19,807	17,989	37,796	2,152	1,270

During the year policy has been clarified on capital costs of new centres and on maintenance charges for centres serving general industry (i.e., excluding those concerned exclusively with waterfront industries).

In future the Department of Health will provide the land necessary, and capital costs for new centres will be met 50 per cent by the Workers' Compensation Board and 50 per cent from the Industrial Welfare Deposit Account. Maintenance charges for existing and future centres serving general industry will be apportioned  $33\frac{1}{3}$  per cent each to the Department of Health, Workers' Compensation Board, and Industrial Welfare Deposit Account.

On this basis it has been agreed to replace the Woolston centre in properly designed accommodation and to establish a new centre in the Mt. Wellington area, Auckland, as an outpost of the Penrose Industrial Health Centre. The interest and generosity of the Workers' Compensation Board in this matter is particularly encouraging and will enable a steady programme of development in the future.

### **Occupational Medical and Nursing Arrangements**

There are no statutory provisions governing the establishment of medical and nursing services in industry, but in common with other industrial countries there has been a steady growth of nursing and medical services within New Zealand industry.

Tables 10 and 11 show the current position.

*Table 10—Medical Arrangements  
(Part-time attendance of less than 12 hours weekly)*

		Government	Private	Total
Factories	..	.. ..	28	28
Shop and offices	..	.. ..	3	3
Others	..	.. 2	3	5

Number of workers covered: 22,330.

*Table 11—Nursing Arrangements (Other than Industrial Health Centres): Numbers of Industrial Undertakings (Government and Private) Having Arrangements with Registered Nurses as Under, Year Ended 31 December 1957*

WHOLE TIME				
		Government	Private	Total
Factories	..	.. 12	22	34
Shops and offices	..	.. ..	3	3
Others	..	.. 2	3	5

Number of workers covered: 27,623.

PART TIME				
		Government	Private	Total
Factories	..	.. 2	..	3
Shops and offices	..	.. ..	..	..
Others	..	.. ..	..	..

Number of workers covered: 838.

## Notification of Occupational Diseases

Table 12 gives the official notifications received, together with the number of cases which have come to the notice of district officers from all sources:

*Table 12—Notification of Diseases Arising from Occupation*

	Whangarei	Auckland	Hamilton	Gisborne	New Plymouth	Palmerston North	Wellington	Nelson	Christchurch	Timaru	Dunedin	Invercargill	Rotorua	Total
Official notifications .. .. ..	1	96	23	18	10	11	28	2	37	9	30	2	16	283
All sources—														
1. Skin diseases arising from occupation—														
Dermatitis due to oils and greases .. .. ..	6	2	..	1	1	8	..	6	2	1	..	1	28	
Dermatitis due to solvents .. .. ..	31	1	..	1	..	4	..	21	1	8	..	5	72	
Dermatitis due to cement .. .. ..	5	..	..	..	4	1	..	2	..	2	..	5	19	
Dermatitis due to formaldehyde .. .. ..	..	..	..	..	..	..	..	3	..	..	..	..	3	
Dermatitis due to sheep dip .. .. ..	..	4	..	..	..	..	..	..	..	..	..	..	4	
Dermatitis due to treated timber .. .. ..	..	3	..	..	..	..	..	..	..	..	..	..	3	
Dermatitis among freezing workers .. .. ..	16	..	..	..	..	..	..	..	..	..	..	..	16	
Dermatitis due to other causes .. .. ..	29	..	4	..	14	4	1	..	3	16	2	..	73	
Other diseases of the skin .. .. ..	..	3	5	..	..	1	..	3	..	..	..	..	12	
Sub-totals .. .. ..	87	13	9	2	19	18	1	35	6	27	2	11	230	
2. Diseases due to dusts, fumes, gases, vapours, or mists—														
Chronic lead poisoning .. .. ..	1	..	..	..	..	..	2	..	..	2	..	..	..	5
Phosphorus poisoning .. .. ..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Poisoning from any insecticide, weedicide, fungicide, or animal poison met with at work .. .. ..	..	1	..	..	..	4	..	..	..	1	2	..	10	18
Poisoning from any gas, fumigant, or refrigerant met with at work .. .. ..	..	2	..	..	..	..	1	..	1	..	1	..	..	5
Poisoning from any solvent met with at work .. .. ..	..	1	..	..	6	1	..	..	1	..	..	..	..	9
Poisoning from any metal or salt of any metal met with at work .. .. ..	..	1	1	1	..	1	1	..	7	..	..	..	..	12
Diseases of respiratory system arising from occupation .. .. ..	..	2	..	..	..	1	..	..	1	..	..	..	..	4
Sub-totals .. .. ..	1	8	1	1	6	7	4	..	10	3	3	..	10	54
3. Diseases due to physical agents—														
Compressed-air illness .. .. ..	..	..	47	..	..	..	..	..	..	..	..	..	..	47
Damage to eyesight—														
(a) Non-traumatic physical agents .. .. ..	..	..	1	..	..	1	..	..	..	..	4	..	1	7
(b) Trauma .. .. ..	..	..	3	8	2	2	..	6	1	7	..	1	..	30
Sub-totals .. .. ..	..	50	9	2	2	1	6	1	7	..	5	..	1	84
4. Occupational diseases due to infectious agents—														
Leptospirosis .. .. ..	..	..	..	..	..	..	4	..	..	..	..	..	9	13
Brucellosis .. .. ..	..	..	..	..	..	2	..	..	..	..	..	..	..	2
Sub-totals .. .. ..	..	..	..	..	..	2	..	4	..	..	..	..	9	15

The publication *Notes on Diseases Arising from Occupation* prepared for the information of medical practitioners has been revised and reissued.

1. *Occupational Dermatoses*—Dermatitis, as can be expected, continues to form the bulk of notifications received. The significant causitive agent is shown in Table 12.

2. *Occupational Diseases Due to Dusts, Fumes, Gases, Vapours, Mists, etc.*—A variety of toxic agents result in the notifications received. Lead, electroplating, and agricultural chemicals are dealt with under a separate heading in this report. The well-known toxic agents continue to take their toll, as is instanced by a case of death following use of carbon tetrachloride to clean the bars of an electric radiator in a photographer's dark room. All districts have been equipped with portable gas-detection equipment against a wide range of toxic gases, which now enables expeditious investigations to be made when notifications are received.

A preliminary investigation into "Coal Workers' Pneumoconiosis in New Zealand" was published by Dr F. A. De Hamel of the Christchurch/Greymouth district in the *New Zealand Medical Journal* of October 1957. This is to be followed up in 1958 with a full-scale investigation among mine workers in the Grey Valley area. The Mines Department is giving full support to this project, which all unions concerned have endorsed.

Since publication in 1954 of *A Report of a Health Survey Made on the New Zealand Gas Industry*, consultations have been held with the New Zealand Gas Association on the necessity of a safety code. The death from carbon-monoxide poisoning of a maintenance worker has refocused attention on the need for such a code.

3. *Occupational Diseases due to Physical Agents*—Apart from trauma affecting the function of the eye permanently, the other eye condition most commonly notified is the arc flash of electric welding. Both are open to relatively simple preventive measures.

Compressed-air illness figures prominently in the notifications. Fortunately only two of the cases were serious and the others were comparatively mild. All arise on the Auckland Harbour Bridge project where the men are under regular supervision by medical officers and Mr N. G. Thom, Inspector of Health. The incidence is comparable with that experienced in similar works elsewhere, but the position over supervision would be improved if departmental officers had statutory backing for their requirements. It is noted that in the United Kingdom, regulations to protect the health and safety of men employed on work in compressed air came into operation on 21 April 1958. Only six cases were notified to the United Kingdom Chief Inspector of Factories in 1956. Draft regulations have been prepared and are under discussion with the Department of Labour.

4. *Occupational Diseases Due to Infectious Agents*—These are normally notifiable infectious conditions which originate in consequence of employment. They are also included in Table 6B.

Leprosirosis is the predominant infection notified and is generally connected with farming or allied occupations. One case caused by *L. icterohaemorrhagica* is reported in a young man aged 20 years employed as a sewer worker by the Auckland Metropolitan Drainage Board. Other men employed by the board were advised on protective clothing to be worn.

### Workers Exposed to Lead

Table 13 summarises the supervision undertaken.

*Table 13—Supervision of Workers Exposed to Lead*

Industry	Number of Firms	Approximate Number of Workers Under Supervision	Number of Examinations	Number Absorbing Lead in Unhealthy Quantity	Number of Cases of Lead Poisoning Notified
Battery manufacture, assembly, and repair .. ..	22	214	1,513	94	2
Lead smelting and recovery .. ..	16	58	293	20	1
Paint manufacture, painting, and spraying .. ..	19	141	388	1	..
White-lead manufacture .. ..	..	..	..	..	..
Printing and newspapers .. ..	57	515	652	10	1
Motor-body assembly and lead buffing .. ..	4	88	399	4	..
Ship repair .. ..	2	20	82	..	..
Lead burning and sulphuric acid manufacture .. ..	7	42	321	4	1
Plumbers and apprentices .. ..	..	..	..	..	..
TEL blending, petrol-pump cleaning, and repairs, etc. .. ..	1	4	8	4	..
Other industries .. ..	31	301	462	8	..
Totals .. ..	159	1,383	4,118	145	5
Totals, 1956 .. ..	177	1,667	4,382	230	6

Of those workers found to be absorbing lead in an unhealthy quantity nine were suspended altogether, nine were suspended from working with lead, seven were removed from overtime, and one was admitted to hospital.

In one battery factory employing 60 men, three were totally suspended and six suspended from overtime. The marked increase in stipple counts stemmed from a combination of poor appreciation of the hazard by management, poor housekeeping, careless handling of lead oxide after a change from the usual drum to a newer and lighter one, and the weighing out of lead oxide in the general plant.

An unusual case was reported from Ashburton where lead poisoning was established with laboratory and clinical evidence. The only association with lead appeared to be a short period spent filling 44-gallon drums with leaded petrol, and the source of the lead intoxication has never been really established.

### Workers Engaged in Electroplating Processes

Table 14 sets out the results of regular supervision.

*Table 14—Supervision of Workers Engaged in Electroplating Processes*

District	Number of Firms	Approximate Number of Workers Under Supervision	Number of Examinations	Number of Workers Suffering from Conditions Arising from Occupation
Whangarei .. ..	2	..	..	..
Auckland .. ..	34	74	406	9
Hamilton .. ..	..	..	..	..
Gisborne .. ..	3	4	..	..
New Plymouth .. ..	..	..	..	..
Palmerston North .. ..	5	21	78	..
Wellington .. ..	16	41	137	3
Nelson .. ..	1	1	..	..
Christchurch .. ..	21	69	648	16
Timaru .. ..	..	..	..	..
Dunedin .. ..	9	17	169	1
Invercargill .. ..	2	5	10	..
Rotorua .. ..	..	..	..	..
Totals .. ..	93	232	1,448	29

Conditions discovered include four chrome ulcers, six cases of dermatitis, and three chest conditions.

### Working With Agricultural Chemicals

Notifications of poisoning are relatively few. A clear case of lindane poisoning from the use of a fruit-tree spray occurred in which no precautions were taken. Some cases of organo-phosphorus poisoning were also reported. The Medical Officer of Health, Gisborne, quotes a case in which an orchardist had been spraying with a semi-concentrate turbo-mist-spraying outfit using parathion. Because the air appeared so still he did not bother to wear a mask while spraying, walking up and down rows of trees inhaling parathion mist. His first symptoms were headache and nausea, but he rejected the suggestion to stop spraying and consult a doctor, continuing with his programme the following day when he was again nauseated with tinnitus and headache. He was seen by his doctor at 2 a.m. the next morning, having collapsed on his bedroom floor. It was a clearly established case of poisoning from an organo-phosphorus, in the use of which no safety precautions were taken. Some other suspicious incidents have been reported, some of which are still under investigation.

During the year the Medical Officer of Health, Nelson, has been conducting a pilot project, from which it is hoped to develop a national programme of education and supervision in the use of insecticides.

Orchardists have given unreserved collaboration. The wall placard "Recommended Protective Measures for Handling Organic Phosphorus Compounds" was produced for this programme. The Medical Officer of Health, using a field kit for the estimation of blood cholinesterase levels, tested orchardists using metramac, parathion, malathion, and metasystox. In one case only was there any depression of the cholinesterase activity. This was in an orchardist spraying parathion for a period of eight hours, using a turbo-mist machine with face and hands exposed. The depression was only slight and caused no symptoms. As metramac was not used in significant quantities or for sufficient length of time no information of value was gained.

In general these insecticides are not used or applied for periods of longer than eight hours in every 10 to 14 days. At the present time it would appear that danger to the orchardist is minimal other than in cases of gross negligence, and the accidental poisoning of children. The Medical Officer of Health, Nelson, forecasts that in the future there will be an increasing use of more toxic insecticides and that the time will come when orchardists will need to be kept under constant supervision with regular estimations of blood cholinesterase levels. Such a procedure may well be done by the public health nurses trained to use a field kit. At the moment it appears desirable that persons engaged in contract spraying of organic phosphorus compounds should be under such supervision.

Aerial spraying of deadly poisons and organic phosphorus compounds other than malathion appears to be a developing industry. To ensure that pilots protect themselves, ground crews and those in the vicinity of operations, a permit system has been introduced by the Civil Aviation Administration in conjunction with this Department and the Department of Agriculture. The poisons specified may not be sprayed in a wind velocity exceeding 5 m.p.h. or when the plane is higher than 10 ft from the ground. Inspectors of health report on the individual operations. A booklet, *Chemical Sense for Spray Pilots*, based on this Department's requirements has been prepared and is on issue to pilots by the Civil Aviation Administration.

A number of districts report increasing concern with the handling and usage of agricultural chemicals. *Notes on Economic Poisons* has been revised and reprinted to give basic ingredients of the main preparations on the market, together with appropriate treatment in cases of poisoning. Generous assistance given this Department by the Communicable Diseases Centre of the United States Public Health Services is acknowledged. Arrangements have been made for obtaining laboratory confirmation of poisoning by chlorinated hydrocarbon with the Dominion Laboratory and by organic phosphorus compounds with the National Health Institute.

### Examination of Juveniles

Table 15 shows the number of examinations under section 37 of the Factories Act 1946 for each year since 1951.

*Table 15—Examination of Juveniles*

Year	Number Examined	Number of Certificates of Fitness Issued	Number Rejected	Percentage Rejected
1957 .. .. ..	3,774	3,767	7	0·2
1956 .. .. ..	3,624	3,616	8	0·2
1955 .. .. ..	3,513	3,509	4	0·1
1954 .. .. ..	3,006	3,000	6	0·2
1953 .. .. ..	3,182	3,170	12	0·4
1952 .. .. ..	2,967	2,952	15	0·5
1951 .. .. ..	2,916	2,905	11	0·4

### General

During the year audiometric examination of workers exposed to noise at the Wairakei geothermal project have been regularly made by the Medical Officer of Health, Rotorua, and a number of other similar investigations made in other plants.

A survey of lighthouse first aid was made and recommendations followed to the Marine Department. The Rotorua district is keeping under X-ray surveillance workers involved with the handling of diatomaceous earth.

The Occupational Health section of this division maintains close working liaison with the Departments of Labour, Agriculture, Marine, and Civil Aviation, with the Waterfront Industry Commission and the Workers' Compensation Board. It takes this opportunity to acknowledge the assistance received, not only from these agencies, but also from the Royal New Zealand Navy in connection with underwater work in compressed air and the RNZAF Aviation Medicine Unit for assistance in dealing with low-temperature problems.

## POISONS AND DANGEROUS DRUGS

### Poisons

It is apparent that the provisions of the Poisons Act 1934 have become inadequate to deal with the problems connected with poisons. When that Act was prepared most of the known poisons had been in established use for many years. At first the new poisons which appeared could be conveniently fitted into the framework of the Act, but the tempo of chemical development has now altered the situation. It is probable that more new poisons in larger quantities, and for use by new methods, have come into New Zealand in the last 10 years than existed at the beginning of that period. Many highly toxic substances have been sold and used without regard for the hazards involved and without information being provided to users of the precautions they should take.

The toll of human suffering from poisoning cannot be measured. Full details of the extent of poisoning are not available or obtainable at present, but it is known that in 1956 some 930 cases of poisoning were treated in public hospitals and the cost of this treatment is estimated to be not less than £16,000. To a large degree these cases have arisen

from carelessness in the home, but inquiries also show that there is a general laxity in observing reasonable safety measures in many places where poisons are handled, packed, and sold.

During the year a substantial amount of information has been obtained both within the country and from overseas on the poisons at present in use and the desirable precautions in their handling, thus enabling a reassessment of the provisions governing distribution and use of poisons in New Zealand to be made.

### Dangerous Drugs

The total consumption of dangerous drugs over the years has shown a fluctuating increase which is greater than the population increase. The wide use of newer synthetic drugs with addiction-producing potential has been in addition to, rather than in substitution for, the older drugs of similar pharmacological effect. The inspection of records required to be kept by persons authorised to handle dangerous drugs is the source from which addicts are traced. The number of known addicts has decreased irregularly from a peak figure of 72 in 1953 to 42 in 1957. This is due to successful early detection by inspecting pharmacists and the willing cooperation of the medical profession with the Department's requirements.

### AIR POLLUTION

In last year's report reference was made to the visit of Mr W. A. Damon from the United Kingdom, and to his report *Air Pollution in New Zealand* which had been published in February 1957.

Associated with Mr Damon's visit was Mr J. L. Sullivan of the Division of Industrial Hygiene of the Department of Public Health, New South Wales. Mr Sullivan visited New Zealand on three occasions and established a number of air-sampling stations in the South Auckland area. His report *An Investigation of Air Pollution Problems in the South Auckland Area* was published in November 1957.

During the year Part V of the Health Act 1956, which relates to air pollution, was brought into force on 1 June 1957. Air Pollution Regulations which came into force on 1 January 1958 were also gazetted. These deal with standards of air effluent for sulphuric-acid plants, superphosphate works, and lead works.

The Chemical Inspector required for the administration of Part V of the Health Act was appointed on 1 January 1958 and has been some time with the United Kingdom Alkali Inspectorate before coming to New Zealand in April 1958.

### ACKNOWLEDGMENTS

My particular thanks are due to Dr D. P. Kennedy, the Assistant Director, whose help has been invaluable during this difficult first year of my administration of this division. I wish also to acknowledge the help and cooperation I have received from medical officers of health and senior inspectors, and from the Principal Inspector, Mr T. W. Adams, the Senior Executive Officer of the Division, Mr H. W. Carter, and all the officers of the division.

L. S. DAVIS,  
Director, Division of Public Hygiene.

## REPORT OF THE DIRECTOR, DIVISION OF MENTAL HYGIENE

### GENERAL

The greater proportion of the New Zealand public do not appreciate the nature and scope of the work of its mental hospitals. Perhaps the most popular belief is that they are mainly places of compulsory detention and custodial care. It is widely believed that mental disorder is fundamentally an illness of few recoveries, but this is entirely wrong because last year 2,638 persons were discharged back to community life. Few realise the degree of comparative freedom and liberty which hundreds of our patients enjoy and of the pleasures, recreations, and living standards which approximate to those of people living in the community. It is to be noted that 1,726 persons sought treatment in the mental hospitals of their own volition, and as such are free to come and go more or less at will.

It is not widely enough known that the work of the medical staff is not limited to the work in the mental hospitals. Many psychiatric out-patient clinics at public hospitals are staffed by our medical officers acting in an advisory consultative capacity. In addition similar extra-mural work is performed for societies, welfare groups, Courts of Justice, etc.

It is regretted that owing to medical staff shortage it has not been possible to give as much time to this extra-mural work as is requested.

The question of psychiatric services in public hospitals is receiving considerable attention at the moment and a committee to inquire into and report on these services was set up by the Board of Health at the end of the year.

The medical staff of the division has given a great deal of consideration recently to the administrative set-up in New Zealand of mental hospitals and psychiatric services generally. From time to time there have been those who advocate that mental hospitals should be controlled by existing hospital boards as part of their medical services. Others have suggested independent local boards having the responsibility for administration of mental hospitals and mental-deficiency institutions. Others have suggested that there should be local advisory committees and a central advisory council with the object of bringing before whatever administrative body exists the layman's suggestions and advice in regard to patients' treatment and care as well as staff matters. The medical staff very largely favours a central administration. The medical superintendents mainly favour the setting up of local advisory committees to bring various matters before the local administrations and a central advisory council to bring before the central administration matters of national import plus those that have not been resolved at local level. This scheme of advisory bodies appears to have a great deal of merit. The central advisory council proposal follows the plan of the Mental Hygiene Authority of Victoria, Australia.

It has to be realised that it is easy to dictate policy without having any administrative responsibility. The present responsibility of the division is to give the best possible service to the community having regard to the considerations of available manpower and finance and to plan for future development along the lines of modern trends in psychiatry as they can be applied to New Zealand's needs.

## STATISTICS

### Admissions and Discharges (Provisional Figures)

During the year 14,378 persons (including voluntary boarders) were under care of mental hospitals in New Zealand at one time or another. The weekly average number of occupied beds was 9,847. At the end of the year 10,796 persons were on the register of the division, including those at Ashburn Hall, the private licensed institution at Dunedin, as well as those on leave in the care of relatives or friends.

The Medical Statistics Branch has continued with the publication of detailed analyses of the statistical material concerning the medical work of the division. The report has evoked interest both in this country and overseas.

Persons admitted to mental hospitals during the year numbered 3,665, an increase of 125 persons on the figures for the previous year. The increase is smaller by 207 than it was for the year 1956, although variations in such a figure may not have a great significance. Of the number admitted 1,726 were voluntary boarders, that is, those persons presenting themselves of their own volition for admission. This is an increase of 111 on last year. Those admitted by order of a Magisterial or other authority numbered 1,939, an increase of 14.

The total number discharged during the year was 2,638, or 72 per cent when calculated on the number admitted. Of the number discharged 1,788 were classified as "recovered", 48·8 per cent when calculated on the figure for those admitted.

## STAFFING

There are three sections in which our staffing is much below strength and in which if recruits were obtainable we would increase our present establishments.

(1) *Medical*—There are serious shortages of medical staff and I do not know of any section of the Public Service which works harder and longer hours without additional remuneration as does our medical staff. The increased standard of treatment and care in our hospitals has made greater demands. In addition there are constantly increasing demands for services outside the hospital from Courts, general practitioners, employers, and Government Departments.

In recent years we have been endeavouring to make the service more attractive to young medical men. We have adopted the policy of initial postings to metropolitan hospitals, encouraged the taking of university courses in psychology, and have made available bursaries on full pay for a year for overseas study courses to junior medical staff after two years' service with a view to improving the academic and clinical qualifications so that we may build a sound medical staff for our hospitals and at a later stage for outside practice if personal desires are such.

In addition the senior medical staff participate in a sabbatical leave scheme for nine months on full salary plus an allowance towards travelling expenses.

Five medical officers have so far participated in the junior scheme which is successful and popular and is continuing.

Several other medical officers have obtained leave to pursue studies overseas on their own account.

It is a pity that we cannot attract enough recruits from New Zealand sources and it appears that we shall have to seek staff from overseas.

To ease the burden of the full-time medical staff we have appointed some part-time specialists for extra-mural work and would be happy if we could further implement this scheme.

(2) *Nursing*—The male nursing staff establishment is 1,000; the effective strength at the end of the year was 912.

The female nursing staff is substantially short, although there has been a steady improvement in numbers and quality over the past year or two. The establishment is 940; the effective strength 712; the shortage is 229, which is the lowest figure for many years. Much overtime is, however, being worked.

During the year, for the first time, two courses in administration were held for senior staff. This was most successful and will be continued.

(3) *Social Workers*—There is no provision for training psychiatric social workers in New Zealand. Trained and experienced social workers do wonderful work but with increased emphasis on outpatient work and rehabilitation of patients it is desirable to have trained psychiatric social workers. It may be possible to work out a scheme for this with the school of Social Science at Victoria University of Wellington. The possibility of recruiting from overseas will be explored next year.

Welfare officers were appointed to Auckland and Sunnyside during the year with a view to organising various recreations for patients who otherwise would not participate. This is proving a success and it is hoped it can be extended.

It is planned to have appointed next year a psychologist at each of our four metropolitan hospitals. This will be a pilot scheme for the employment of our own psychologists both for intra-mural and extra-mural work associated with psychiatry.

Authority has been obtained to appoint an industrial social worker at one of our hospitals to aid in the rehabilitation of patients.

## LEGISLATION

During the year an amendment was made to the Mental Health Act which provided for the establishment of hostels near occupation centres and groups so that intellectually handicapped children whose homes are in the country could be accommodated and get training; provision was also made for hostels to accommodate on a permanent basis those intellectually handicapped persons beyond school age who are not able to fend for themselves in the community. Provision was also made for recognised organisations to accommodate intellectually handicapped children under school leaving age for prolonged periods so that they might have training and care. Admissions to such hostels have been divorced from the formal principal legal provisions of the Mental Health Act.

The Hospitals Act of 1957, under Part V relating to private hospitals, made provision, for the first time, for psychiatric hospitals as a separate kind of private hospital divorced from any restrictive measures of the Mental Health Act in regard to admission, etc., for those cases not of a certifiable nature, but there are safeguards in the provision for inspection of these hospitals.

Published during 1957 is the report of the Royal Commission on Law relating to Mental Illness and Mental Deficiency in England and Wales. This report might be described as revolutionary if applied to New Zealand. But here it can be said that my predecessor in office formulated and had printed legislative recommendations which in some essential respects made provisions similar to those recommended by the Royal Commission. Suffice it to say that the 1954 amendment and the 1957 amendment to the Mental Health Act are precursors to a similar approach in regard to admission.

The recommendations of the Royal Commission have not yet been implemented by legislation but the division is keenly interested in the recommendations and the possible advantages they may have if applied to New Zealand.

### TREATMENT

There were no major innovations in therapy introduced during the year. Recognised methods of treatment including the latest physical and pharmacological methods continued in use at all hospitals. It is sometimes suggested by critics that the very valuable physical adjuncts to modern psychiatric practice are used indiscriminately in our hospitals. General allegations of this kind are difficult to refute; what is often overlooked is that they are even more difficult to substantiate. It can be stated unequivocally that there is no reasonable basis for such accusations.

The more spectacular nature of some of the physical methods of treatment at times distracts attention from the fact that these treatments are not ends in themselves, but serve merely to make possible the earlier or fuller integration of the acutely disturbed patient into the overall scheme of social and occupational rehabilitation which is the foundation of all successful mental hospital treatment. It has always been recognised by the medical staff of the division that, valuable as these treatments are, they have their proper place only as adjuncts to the general therapeutic programme of the hospital.

To those suffering a breakdown in mental or emotional health the psychiatric hospital offers a degree of understanding and acceptance which is available nowhere else in the community. The intangible but critically important "atmosphere" of the hospital is its most valuable therapeutic agent. This atmosphere is dependent not on any material provision but on the skill, knowledge, and sense of purpose which animate all members of the staff. While it may be difficult to define, its presence is not hard to detect.

New Zealand has already a considerable tradition of enlightened mental hospital care. The Mental Health Act, originally written in 1911, was for its day a very liberal and far-sighted piece of legislation. The need to progress with the advance of knowledge and the increase of understanding in the field of psychiatry by both lay and medical

members of the community should not be construed as criticism of the past. No worth-while progress will be achieved unless it is planned in terms of what is most valuable in our existing institutions.

### Preventive Psychiatry

It is readily conceded that on theoretical grounds the notion of a preventive programme in mental health is admirable. However, there is as yet no general agreement as to the nature and content of such a programme; nor is there convincing objective evidence that any scheme at present in operation overseas has achieved substantial results. Despite this, the preventive field must be regarded as a most important one.

### ACCOMMODATION, MAINTENANCE, AND NEW BUILDING

Our standard accommodation for patients has reached 8,748 with an average of 9,770 occupied beds. The overcrowding is 1,022. This is an improvement on the figures last year. There is now apparent the impact of our building programme policy which aims at having completed for occupation six new 50-patient villas each year. During 1957 seven new villas were completed and, in addition, 14 villas were in varying stages of construction. Our financial allocation for capital building expenditure for the year 1957-58 was £850,000 and the expenditure was £841,000. This is the highest figure ever reached.

During the year the main building at Seacliff showed further signs of deterioration and had to be evacuated, with a consequent loss of some hundreds of beds. It was possible to accommodate some at Cherry Farm, which is a replacement hospital for Seacliff, but some 200 had to be accommodated elsewhere; included in this number were several top-line security patients. There is urgent need for a security block at one of our hospitals and the plans for this are well advanced.

The maintenance of our buildings and renovations have continued.

### APPRECIATION

I wish to thank the district inspectors, official visitors, and clergy who spend their time so readily in the interests of patients. There are in addition numerous organisations who make arrangements for the welfare and recreation of patients. While these cannot be mentioned individually in this report, they can be assured that their efforts are valued and appreciated by both patients and staff of all hospitals.

In conclusion, I should like to express my thanks to the staff of the division for their continued good work on behalf of our patients.

R. G. T. LEWIS,  
Director, Division of Mental Hygiene.

Table 16—Admissions, Discharges, and Deaths, 1957

## (a) Voluntary Boarders

Hospitals	In Hospital on 1 January 1957	Admissions in 1957									Total Number of Cases Under Care		
		First Admissions			Not First Admissions								
Auckland ..	..	M. 53	F. 89	T. 142	M. 119	F. 136	T. 255	M. 90	F. 115	T. 205	M. 262	F. 340	T. 602
Kingseat ..	..	19	27	46	21	21	42	20	17	37	60	65	125
Raventhorpe ..	..	1	9	10	..	..	..	..	..	..	1	9	10
Tokanui ..	..	31	48	79	47	52	99	19	31	50	97	131	228
Lake Alice ..	..	1	..	1	..	..	..	..	..	..	1	..	1
Levin Farm ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Porirua ..	..	55	66	121	91	108	199	98	85	183	244	259	503
Nelson ..	..	25	36	61	9	18	27	6	9	15	40	63	103
Seaview ..	..	2	10	12	13	13	26	12	9	21	27	32	59
Sunnyside ..	..	37	47	84	65	69	134	27	44	71	129	160	289
Seacliff ..	..	41	38	79	37	58	95	35	47	82	113	143	256
Ashburn Hall ..	..	22	33	55	43	95	138	21	26	47	86	154	240
<b>Totals</b>	..	<b>287</b>	<b>403</b>	<b>690</b>	<b>445</b>	<b>570</b>	<b>1,015</b>	<b>328</b>	<b>383</b>	<b>711</b>	<b>1,060</b>	<b>1,356</b>	<b>2,416</b>

## Voluntary Boarders Discharged, Transferred to Register of Patients, and Died

Hospitals	Discharged									Transferred to Register of Patients	Died	Total				
	Recovered			Improved			Unimproved									
Auckland ..	M. 148	F. 90	T. 238	M. 38	F. 138	T. 176	M. 7	F. 15	T. 22	M. 2	F. 3	T. 5	M. 199	F. 254	T. 453	
Kingseat ..	20	21	41	11	8	19	4	4	8	..	..	..	35	36	71	
Raventhorpe ..	..	..	..	..	..	..	..	1	1	..	2	2	..	1	4	
Tokanui ..	40	53	93	16	7	23	5	11	16	..	..	..	7	4	11	
Lake Alice ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Levin Farm ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Porirua ..	125	148	273	47	24	71	6	7	13	..	2	2	8	9	17	
Nelson ..	13	14	27	1	..	1	1	1	2	..	..	..	3	1	4	
Seaview ..	10	11	21	5	6	11	..	1	1	1	..	1	1	1	17	
Sunnyside ..	42	52	94	26	44	70	9	8	17	1	1	2	8	1	9	
Seacliff ..	17	71	88	28	23	51	11	7	18	..	1	1	6	2	8	
Ashburn Hall ..	35	86	121	18	23	41	8	4	12	..	1	1	1	..	1	
<b>Totals</b>	<b>..</b>	<b>450</b>	<b>546</b>	<b>996</b>	<b>190</b>	<b>273</b>	<b>463</b>	<b>51</b>	<b>59</b>	<b>110</b>	<b>4</b>	<b>10</b>	<b>14</b>	<b>38</b>	<b>29</b>	<b>67</b>
													<b>733</b>	<b>917</b>	<b>1,650</b>	

Hospitals	In Hospital on 31 December 1957	Average Number Resident During the Year			Percentage of Recoveries on Admission During the Year	Percentage of Deaths on Average Number Resident During the Year							
		M.	F.	T.									
Auckland ..	..	M. 63	F. 86	T. 149	M. 57	F. 72	T. 129	M. 71	F. 36	T. 52	M. 7·0	F. 11·1	T. 9·3
Kingseat ..	..	25	29	54	22	30	52	49	55	52	..	10·0	5·8
Raventhorpe ..	..	1	5	6	1	6	7	..	..	..	..	16·7	14·3
Tokanui ..	..	29	56	85	28	34	62	61	64	62	25·0	11·8	17·7
Lake Alice ..	..	1	..	1	1	..	1	..	..	..	..	..	..
Levin Farm ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Porirua ..	..	58	69	127	57	73	130	66	77	71	14·0	12·3	13·1
Nelson ..	..	22	47	69	17	20	37	87	52	64	17·6	5·0	10·8
Seaview ..	..	10	14	24	6	14	20	40	50	45	16·7	..	5·0
Sunnyside ..	..	43	54	97	37	53	90	46	46	46	21·6	1·9	10·0
Seacliff ..	..	51	39	90	40	34	74	24	68	50	15·0	5·9	10·8
Ashburn Hall ..	..	24	40	64	21	37	58	55	71	65	4·8	..	1·7
<b>Totals</b>	<b>..</b>	<b>327</b>	<b>439</b>	<b>766</b>	<b>287</b>	<b>373</b>	<b>660</b>	<b>58</b>	<b>57</b>	<b>58</b>	<b>13·2</b>	<b>7·8</b>	<b>10·2</b>

Table 16—Admissions, Discharges, and Deaths, 1957—(continued)  
(b) Patients

Hospitals	In Hospital on 1 January 1957	Admissions in 1957						Transfers	Total Number of Cases Under Care		
		First Admissions			Not First Admissions				M.	F.	T.
Auckland ..	738 824 1,562	124 137 261	48 40 88	14 10 24	924 1,011 1,935						
Kingseat ..	477 447 924	64 79 143	6 18 24	11 9 20	558 553 1,111						
Raventhorpe ..	10 261 271	.. ..	.. 2 2	.. 16 16	10 279 289						
Tokanui ..	427 442 869	75 83 158	28 35 63	7 2 9	537 562 1,099						
Lake Alice ..	219 .. 219	.. ..	.. ..	11 .. 11	230 .. 230						
Levin Farm ..	274 121 395	46 20 66	.. ..	5 5 10	325 146 471						
Porirua ..	578 831 1,409	173 205 378	94 89 183	17 8 25	862 1,133 1,995						
Nelson ..	548 476 1,024	28 35 63	8 13 21	31 7 38	615 531 1,146						
Seaview ..	215 291 506	10 9 19	3 1 4	16 21 37	244 322 566						
Sunnyside ..	720 772 1,492	78 97 175	15 23 38	32 9 41	845 901 1,746						
Seacliff ..	749 582 1,331	99 91 190	13 34 47	2 2 4	863 709 1,572						
Ashburn Hall ..	7 14 21	4 10 14	.. 2 2	1 1 2	12 27 39						
Totals ..	4,962 5,061 10,023	701 766 1,467	215 257 472	147 90 237	6,025 6,174 12,199						

Hospitals	Patients Discharged, Transferred, and Died														
	Discharge						Transferred			Died			Total		
	Recovered			Improved		Unimproved									
Auckland ..	M. 73	F. 103	T. 176	M. 16	F. 17	T. 33	M. 20	F. 14	T. 34	M. 16	F. 22	T. 38	M. 72 197	F. 77 233	T. 430
Kingseat ..	12	16	28	2	5	7	8	14	22	6	10	16	50	50	100
Raventhorpe ..	..	1	1	..	..	..	..	..	..	3	5	8	..	10	10
Tokanui ..	41	52	93	7	5	12	11	5	16	8	5	13	45	27	72
Lake Alice ..	1	..	1	..	..	..	..	..	..	5	..	5	7	..	13
Levin Farm ..	..	..	..	1	2	3	4	..	4	1	1	2	12	3	15
Porirua ..	119	155	274	17	16	33	17	13	30	47	8	55	79	93	172
Nelson ..	9	17	26	2	2	4	3	5	8	1	4	5	25	22	47
Seaview ..	8	3	11	2	2	4	..	1	1	5	1	6	16	21	37
Sunnyside ..	29	61	90	6	5	11	9	4	13	5	24	29	70	52	122
Seacliff ..	31	56	87	11	9	20	6	14	20	49	8	57	73	58	131
Ashburn Hall ..	..	5	5	..	1	1	1	..	1	1	2	3	..	1	1
Totals ..	323	469	792	64	64	128	79	70	149	147	90	237	449	414	863
													1,062	1,107	2,169

Hospitals	In Hospital on 31 December 1957	Average Number Resident During the Year			Percentage of Recoveries on Admissions During the Year			Percentage of Deaths on Average Number Resident During the Year		
		M.	F.	T.	M.	F.	T.	M.	F.	T.
Auckland ..	..	727	778	1,505	649	636	1,285	42	58	50
Kingseat ..	..	480	458	938	455	417	872	17	16	17
Raventhorpe ..	..	7	263	270	8	260	268	..	50	50
Tokanui ..	..	425	468	893	409	409	818	40	44	42
Lake Alice ..	..	217	..	217	216	..	216	..	..	..
Levin Farm ..	..	307	140	447	273	115	388	..	..	..
Porirua ..	..	583	848	1,431	557	780	1,337	45	53	49
Nelson ..	..	575	481	1,056	543	436	979	25	35	31
Seaview ..	..	213	294	507	210	293	503	62	30	48
Sunnyside ..	..	726	755	1,481	669	682	1,351	31	51	42
Seacliff ..	..	693	564	1,257	660	491	1,151	28	45	37
Ashburn Hall ..	..	10	18	28	8	11	19	..	42	31
Totals ..	..	4,963	5,067	10,030	4,657	4,530	9,187	35	46	41
								9.6	9.1	9.4

*Table 17—Showing the Admissions, Discharges, and Deaths, With the Mean Annual Mortality and Proportions of Recoveries Per Cent of the Admissions*

\* The figures for 1955 and 1956 were not divided into "improved" and "unimproved" but were combined under the heading of "unrecovered". † Not available.

Table 18—Voluntary Boarders Discharged Recovered, 1957

	Stay in Hospital		Males	Females	Total
13 weeks and under	..	..	344	355	699
14 to 25 weeks	..	..	50	77	127
26 weeks and over	..	..	22	34	56
On probation	..	..	34	80	114
Totals	..	..	450	546	996

Table 19—Average Cash Cost of Each Patient for Financial Year 1957–58

Hospitals	Average Number Resident (Inclusive of Voluntary Boarders)	Salaries	Overtime, Penal Rates, Shift, Meal, and Standby Allowances	Bedding and Clothing	Buildings, Equipment, Improvements, Repairs, and Replacements	Farm	Fuel, Light, Power, Water, and Cleaning	Furniture, Furnishings, and Equipment, Including Maintenance
Auckland ..	1,414	£163.72	£35.46	£12.67	£11.59	£2.85	£16.62	£3.30
Kingseat (Papakura) ..	924	137.80	35.48	20.89	9.01	6.07	15.62	8.26
Raventhorpe (Bombay) ..	275	94.99	23.17	2.04	13.78	3.02	14.89	2.18
Tokanui (Te Awamutu) ..	880	145.12	42.14	21.71	6.87	25.23	18.78	8.52
Lake Alice (Marton) ..	217	132.28	45.30	34.26	4.23	18.00	17.58	10.29
Levin Farm (Levin) ..	388	174.22	61.07	68.48	10.67	3.31	32.87	25.5
Porirua ..	1,467	135.04	57.91	21.28	6.48	4.36	19.96	5.12
Ngawhatu (Nelson) ..	1,016	157.98	47.08	10.47	12.25	3.81	18.09	3.62
Seaview (Hokitika) ..	523	159.59	39.25	14.64	6.22	0.64	20.58	5.42
Sunnyside (Christchurch) ..	1,441	184.93	46.51	17.83	9.24	9.18	20.90	5.00
Seacliff ..	1,225	182.13	55.89	18.84	15.61	16.33	30.32	6.28
Head office ..	..	..	1.38	..	..	..	..	..
Average total cost ..	9,770	159.01	45.89	19.34	9.96	8.36	20.54	6.28

Hospitals	Rations	Surgery and Dispensary	Miscellaneous	Total Cost Per Patient (*)	Receipts (†)	Net Cost Per Patient (†)	Net Cost Previous Year	+ Increase or - Decrease in 1957-58
Auckland ..	£38.08	£3.43	£24.94	£312.49	£3.90	£308.59	£283.24	£+25.35
Kingseat (Papakura) ..	42.91	4.84	23.49	304.57	7.24	297.33	255.22	+42.11
Raventhorpe (Bombay) ..	41.49	1.35	21.19	218.10	7.34	210.76	203.65	+ 7.11
Tokanui (Te Awamutu) ..	28.21	4.84	24.62	326.04	14.46	311.58	278.48	+33.10
Lake Alice (Marton) ..	45.38	3.02	48.18	358.52	47.31	311.21	264.19	+47.02
Levin Farm (Levin) ..	61.67	7.59	32.44	477.82	2.39	475.43	400.91	+74.52
Porirua ..	38.55	8.18	22.09	310.79	2.28	308.51	296.82	+11.69
Ngawhatu (Nelson) ..	37.08	3.09	20.63	314.10	6.07	308.03	296.61	+11.42
Seaview (Hokitika) ..	47.08	5.50	23.22	322.64	5.66	316.98	310.25	+ 6.73
Sunnyside (Christchurch) ..	51.63	5.24	29.46	379.92	21.54	358.38	316.50	+41.88
Seacliff ..	45.44	6.55	37.53	414.92	12.21	402.71	363.11	+39.60
Head office ..	..	..	0.93	2.31	..	2.31	2.70	- 0.39
Average total cost ..	42.19	5.23	27.79	344.61	9.88	334.73	304.60	+30.13

\* Cost does not include interest on capital and depreciation on buildings, etc.

† Receipts from maintenance not included.

NOTE—An improved method of enumerating people in hospitals was introduced during 1957. Figures for people remaining in hospital have been amended accordingly.

## REPORT OF THE DIRECTOR, DIVISION OF HOSPITALS

### 1. INTRODUCTION

During the year under review the new Hospitals Bill, which was mentioned in last year's annual report as being in course of preparation, was completed and passed by Parliament and is to come into force on 1 April 1958. This is only the fourth measure of major hospital legislation in New Zealand and it is appropriate in this report to review the past history of hospital administration in this country and to outline the main features of the new Act.

In the earlier stages of settlement, with poor communications, hospitals were organised, constructed, and managed by committees from local communities and obtained finance from donations, patient's fees, voluntary grants from local authorities, and some Government assistance by way of grant towards capital expenditure. This obtained until 1885 when the first national legislation divided the colony into 28 hospital districts with members appointed annually by local authorities but with recognition of the previous voluntary local organisations running hospitals, then called "separate institutions", which also received subsidies from ratepayers and from the Government through hospital boards. This meant two separate systems alongside each other and overlapping in areas and functions, with both dependent for portion of their revenue upon the local ratepayers and the central Government.

The next Act, of 1909, which lasted until 1926, remedied this by incorporating in hospital boards all the separate institutions which could not carry on without financial assistance from the local ratepayer, thus confining his responsibilities to the support of institutions operated by hospital boards. Only nine separate institutions able to carry on without financial assistance from the rates remained after 1909.

In the intervening years to 1926 the improvement of communications, the growth of population, and the development of medical services all had their impact upon the public hospitals and upon their needs for financial assistance from the central Government. The Act of 1926 followed a Commission of Inquiry into the hospital services in 1921 and a subsequent amending Act of 1923 which was largely concerned with providing a systematic basis for payment of Government subsidies.

In 1926 the source of hospital finance fell roughly in equal proportions, one-third on patients, one third on rates, and one-third on Government. Part III of the Social Security Act 1938, providing hospital and maternity benefits, changed these proportions to two-thirds Government and one-third rates, and the stabilisation in 1946 of the maximum rate of hospital board levy on local authorities at one-half penny per pound of the rateable capital valuation coupled with rising expenditure further increased the Government proportion. Legislation in 1951 providing for the levy on local authorities to be reduced by one-twelfth of a penny per pound each year until it ceased on 1 April 1957 signified the end of local rating for hospital support.

Except for loans for major construction still raised by boards but repaid by Government, and a small fraction from miscellaneous revenue, Government has thus become responsible for all public hospitals finance.

Hospital reform had been actively canvassed from 1949 when the Hospital Boards' Association proposed a National Hospitals Commission. This proposal was not adopted by the Government, was not supported by the Consultative Committee on hospital reform appointed in 1953, and is not now favoured by the association. It has disadvantages in that it would divorce the administration of hospitals and their curative health services from the administration of public health and preventive services, and similarly would separate the functions of the Hospitals Division from the other functions of the Department of Health — nursing, tuberculosis, maternal welfare, health benefits, health education, etc. — which are interwoven to a considerable extent with both public health and with hospitals. A similar proposal in the United Kingdom was rejected in 1944 and again in 1953, and the White Papers then issued discourse on the difficulties of reconciling Parliamentary control with commission operation of social services of this nature.

The principal recommendations of the Consultative Committee of 1953 were—

(1) The replacement of the then existing policy of placing primarily on local boards the responsibility of providing hospital services by a new policy under which the Minister would be charged with the duty of establishing a comprehensive and integrated hospital service for the whole of the Dominion. The committee regarded this change of policy as dictated not only by the new concept of the role of the State, but also by the increasing complexity of modern hospital services.

This is given effect to in the new Act. The functions of the Minister of Health on behalf of the Crown and to such extent as he considers necessary, are—

- (a) To ensure the provision and maintenance by hospital boards of hospitals and hospital services to meet all reasonable requirements throughout New Zealand:
- (b) To encourage the provision and maintenance of private hospitals:
- (c) To encourage the provision and maintenance by hospital boards or by voluntary associations of institutions and services for the care or relief of aged, infirm, or incurable persons:
- (d) To coordinate and generally to guide and supervise the activities of hospital boards and other bodies for these purposes.

(2) *The Setting Up of Five Regional Authorities:* This recommendation was not supported by the hospital boards and was not adopted by Government. It was difficult to envisage a clear division of functions between boards, regional authorities, Department, and the Minister, or how members, mainly voluntary and part time, and their staffs, both outside the Government service, could discharge existing departmental functions in direct line of responsibility between the Department and the boards. The England and Wales precedent of 14 regional authorities for a population of 40 million is not necessarily a guide for New Zealand with its population of 2 million.

*(3) A Reduction in the Number of Hospital Boards from 37 to 23:*

The new Act does not reduce the number of boards but provides the means by which union or reconstitution of hospital board districts may be achieved either voluntarily by the boards or by the Governor-General by Order in Council on a recommendation made to the Minister by the Hospitals Advisory Council which is established under the recent Act. The successful example of North Auckland in 1950 when six small boards became the Northland Hospital Board based on Whangarei and the establishment of local committees of management for the outlying hospitals in this district could well be expected to provide the administrative pattern for any future union of hospital board districts.

The new Act retains the Department of Health and the Division of Hospitals as the agencies, under the Minister, for hospital administration. Hospital boards have the direct duty to provide, maintain, and manage the services the Minister deems necessary and, consonant with the responsibilities the Minister undertakes, he is vested with powers of direction to discharge these responsibilities.

A Hospitals Advisory Council of six members, three departmental and three from hospital boards, is established and should play a major role in formulating national hospital policy and making recommendations to the Minister. It can initiate its own business as well as dealing with matters referred to it by the Minister, and on several matters of major concern to boards, where the Act provides the Minister may act on the recommendation of the Council, recommendations shall be made only by a majority of four of the six members.

With the pattern of development of hospital services in New Zealand by a large number of boards originally largely locally financed and only assisted by Government subsidy, there have inevitably been many matters on which local practices and policies have diverged. The change in the Government role from that of subsidising local hospitals to the assumption of responsibility for the provision of hospital services on a national basis will call in many fields for active measures in the formulation of national policies. The Advisory Council undoubtedly will play a major role in the further development of what the Consultative Committee termed "a comprehensive and integrated hospitals service for the whole Dominion".

The Act gives statutory recognition to the Hospital Works Committee (an inter-departmental committee of Health, Treasury, and Works) which reports to the Minister of Health on all major hospital construction proposals.

The financial provisions require, as at present, a board to produce annual estimates of payments and receipts for consideration of the Minister and, now that Government has full responsibility for finance, for an annual grant to be paid to the board out of money appropriated by Parliament of such sum as the Minister may determine having regard to the board's estimates. In the months preceding the introduction of the Act on 1 April 1958 the division has undertaken the revision of financial and accounting regulations and the issue to hospital boards of full instructions on the operation of these for the 1958-59 year.

Part IV of the Act deals with separate institutions which have their only legal existence under the Hospitals Act, and of which only five now remain. A new clause will enable these institutions, if they so desire,

to obtain registration either as an incorporated society or under the Charitable Trusts Act, and if the five do so this part of the Act, after an existence from 1885, would become redundant and could be repealed.

Part V deals with private hospitals. The kinds of private hospitals for which a licence may be granted have been extended and now cover maternity, medical, surgical, psychiatric, convalescent, children's, or a combination of any of these purposes. The number of private hospital beds which have declined relatively and numerically over a long period now appears slightly on the upward trend.

In many respects the 1957 Act simply translates into legislation and administration the evolutionary changes which have taken place since 1926 in the hospitals services and in the role of the central Government. It is hoped it will provide a flexible basis for future similar changes to meet the development of medical science and treatments consequent upon the national growth. While the physical amalgamation of hospital boards has been limited, functional amalgamation of hospital services and changes in their nature have been major. Even in 1926 hospitals were largely local in character. Now base hospitals have been developed and the specialist services — e.g., pathology, radiology, tuberculosis, orthopaedic, cardiac, neurosurgical, and chest surgery, and deep X-ray therapy have been established on a territorial functional basis to make the best use and the most economic distribution of these scarce and expensive specialist skills.

The character of hospital treatment itself has undergone, in recent years, a major change. Hospital boards are now required to provide the bulk of accommodation for maternity patients; industrial and road accidents have increased substantially; and although voluntary organisations are doing excellent work the care of the aged is a growing problem. However, the provision needed for tuberculosis and infectious diseases has reduced substantially, while advances in medical science enables surgery and treatment to be undertaken which would not have been possible in 1926, particularly for patients in the older age group. The ever-widening experience and use by general medical practitioners of modern therapeutic practices and new drugs would appear to have reduced the need to provide hospital care for patients in the younger age group. A more general acceptance by the public of measures to maintain good health is also evidenced by lower hospital admission rates of children and young adolescents. Numerous visits by divisional medical staff during the year have left us with the definite impression that our hospital beds are occupied with a greater proportion of patients in the older age groups. The development of outpatient services, coupled with the use of special departments for investigation prior to admission, not only reduces stay in hospital but also enables many classes of patients who previously required to be admitted now to receive all necessary treatment by general practitioners and as outpatients.

While hospitals depended substantially on local rates and patients' fees there was a substantial variation between boards in the standard of hospital accommodation and services provided, according to the wealth of the district, the period it had been settled, its rate of development, and the outlook of the board and its electors, the ratepayers. The increased financial role of central Government has reduced these variations, but heavy expenditure has been necessary to bring the less developed districts up to a proper standard to conform to the changed

hospital pattern and to replace old or inadequate buildings. Heavy expenditures still fall in the development of those districts now having the greatest rate of population increase.

The development or expansion of a hospital is a complex task requiring coordination in the planning of accommodation for all services – wards, outpatients, laboratory, X-ray, laundry and steam services, nurses and other staff accommodation – in such a way as to enable the existing hospital to function efficiently while extensions are being made.

Hospital services have been affected both in capital and in maintenance costs by the general increase in price levels as well as the special factors of complexity in treatment, equipment, and drugs. Nevertheless, it can fairly be claimed there have been substantial improvements in hospital efficiency as the following figures indicate:

	1948-49	1956-57
Average daily number of occupied beds ..	10,425	11,032
Number of inpatients under treatment ..	177,780	221,562
Number of outpatients .. ..	534,125	688,653
Number of attendances .. ..	1,259,314	1,591,336
Average turnover of inpatients per annum ..	17·1	20·1

If turnover had not increased another 1,600 occupied beds would have been required. During these years the national population increased by over 20 per cent, and very substantially the hospital treatment needs of this increased population have been met by increased efficiency as reflected by the higher turnover and the development of outpatient services, and only to a minor extent by the provision of additional beds.

## 2. SCOPE OF THE REPORT

The scope of this report is indicated by the following brief summary of the matters dealt with.

- (a) *Hospital Accommodation*: The ratio of hospital beds per 1,000 of population after remaining stable at 8·0 in the previous year last year showed a further slight decline to 7·9 per 1,000. Available beds in public hospitals remained the same and beds in private hospitals rose by 66. However, with a rise of over 20,000 in population the increase in beds was insufficient to maintain the existing ratio.
- (b) *Patients Under Treatment*: The number of inpatients under treatment increased again during last year by over 10,000 but the close attention now being given to turnover evidently enabled these additional cases to be treated with only a small rise in occupied beds.
- (c) *Special Departments of Hospitals*: The numbers of examinations by X-ray and pathology departments continued their steady increase, while physiotherapy treatments, which had declined in the preceding year, showed an increase again last year. There was a further small decrease in X-ray therapy treatments. The increases would, in part at least, parallel the increase in patients treated, and may also be attributable partly to the pre-admission investigations referred to in the report.

- (d) *Medical Statistics:* Some figures are quoted from the 1955 (calendar year) volume of medical statistics to illustrate the changing incidence of disease and injury and to illustrate the use made of this type of information so that the hospitals service can adjust itself to the changing needs of the community.
- (e) *Staff:* Staff employed in public hospitals and associated activities at 31 March 1957 totalled 20,939, an increase of 1,207 over the previous year, of which 644 were nurses and 356 domestic and other institutional (non-treatment) staff. Salaries and wages payments rose by £1,095,000 as compared with a year earlier.
- (f) *Hospital Works:* A summary of major hospital works in various stages of planning is presented and forecasts of expenditure, prepared from returns furnished by hospital boards, are given for the next three years. Major works (over £10,000) for which working drawings are being prepared are estimated to cost £7·2 millions, while sketch plans only are being drawn for works valued at £8·9 millions. During 1957–58 ministerial consents for these major building works amounted to £5·8 millions.
- (g) *Finance:* The total expenditure of hospital boards in 1956–57 was £22·4 millions of which £17 millions was for maintenance purposes and £5·4 millions for capital purposes.

Sections are also included in the report dealing with private hospitals, ambulance services, and the inspection and advisory services.

### 3. HOSPITAL BEDS AND PATIENTS TREATED

Hospital board institutions classified as hospitals of various types numbered 198 at 31 March 1958, a net increase of four. Seven hospitals have been added, including four maternity, one general, and two special hospitals, and two institutions were closed. One maternity hospital became a private hospital.

#### Available Beds

The numbers of beds provided in all public and private hospitals at 31 March 1957, at end of the previous year, and at 31 March of each of the two preceding quinquenniums are shown in the following table:

*Table 20*

In hospital board and Department of Health Institutions—		1947	Number of Beds Available at 31 March		
			1952	1956	1957
General	..	12,394	12,395	12,772	12,710
Maternity	..	1,428	1,893	2,214	2,276
		13,822	14,288	14,986	14,986
In private hospitals—					
General	..	1,898	1,735	1,927	2,025
Maternity	..	819	508	432	400
		2,717	2,243	2,359	2,425
Number per 1,000 of population ..	..	16,539 9·3	16,531 8·4	17,345 8·0	17,411 7·9

In addition there were at 31 March 1957, 111 hospital beds in old people's homes. The total non-hospital accommodation for the aged in those homes was 842.

At the end of 1956 it appeared that the decline in the ratio of available beds to population had been arrested, the figure being 8·0 per 1,000 for the years ended 31 March 1955 and 1956. However, the table on page 54 shows a further small decrease in this ratio. That the hospitals are able to cope with the demands made upon them with fewer beds indicates further improved efficiency and this is borne out by the figures set out in the next table.

### **Patients Under Treatment**

The following are the figures for all hospital board and Department of Health hospitals classified as "public hospitals":

*Table 21*

	1947	1952	1956	1957
Average daily number of occupied beds ..	10,915	11,044	11,311	11,322
Percentage of available beds occupied ..	80%	77%	76%	77%
Inpatients under treatment .. ..	179,658	200,328	216,152	226,452
Outpatients under treatment .. ..	444,486	585,921	673,472	692,536
Outpatients attendances .. ..	1,191,074	1,350,475	1,526,256	1,606,262
Dental outpatients .. ..	28,599	26,451	37,639	38,371

Reference to the large-scale savings made in expenditure for the construction of additional hospital beds through improved turnover is made in the last paragraph of the introduction of this report.

There has been no substantial variation in the average percentage of occupancy of hospital beds in recent years but occupancy is a complex matter affected by many factors. It can and does happen that significant advances in the treatment of diseases requiring hospital treatment result in reduced rates of occupancy. This has been the case with tuberculosis where a lesser number of cases in sanatoria produces adverse statistical results in the form of a lower percentage of occupancy and a higher cost per occupied bed. The overall occupancy rate is affected by such factors as staff shortages preventing utilisation of available beds and by the inclusion of all maternity beds in the figures when many maternity hospitals with a relatively low occupancy rate must be maintained to meet the needs of small or isolated communities. Again, a few hospitals have an occupancy rate of 100 per cent or more, but this merely indicates overcrowding with patients in corridors and other space not designed as treatment accommodation and which should be remedied as quickly as possible by the building of additional hospital beds.

### **Special Departments**

Statistics of the work of special departments were first published for 1951–52. Summarised totals (inpatients and outpatients combined) indicating the work done by all hospitals over the past five years are as follows:

*Table 22*

	1952–53 (000)	1953–54 (000)	1954–55 (000)	1955–56 (000)	1956–57 (000)
X-ray diagnostic: Number of examinations .. .. .. ..	543	581	600	609	623
X-ray therapy: Number of treatments .. ..	80	78	81	77	76
Physiotherapy: Number of treatments .. ..	718	786	898	862	900
Pathology: Number of reports .. ..	652	716	793	896	975
	No.	No.	No.	No.	No.
Number of post-mortems .. ..	2,488	2,676	3,072	3,276	3,718

## Physiotherapy Services

The changes in general hospital treatment also affect the design and equipment of physiotherapy departments and the nature of physiotherapy treatment.

Early ambulation not only for surgical but also for some medical cases has given rise to a need for larger exercising areas with less equipment in relation to size and with scope for more class work. The larger hospitals also require an additional but small area where thoracic, maternity (if no provision for them elsewhere), and other cases requiring relaxation or special instruction may be treated without upsetting the timetable of the general gymnasium. Treatment by traction and reciprocal movement training and by ultraviolet ray are increasing and additional small exercise pools, or Hubbard tanks, have been installed where space is very restricted.

## Morbidity Statistics

Figures of disease and injury cases published by the Medical Statistics Branch disclose a changing pattern in the incidence of disease and injury. Some aspects of this change have received publicity in the health education programme and, as a specific example, in the public concern for the care and welfare of our senior citizens. The hospitals service must continually adjust itself to the changing needs of the community and, although it may not always be generally appreciated, we are constant users of the medical statistics. I am grateful to the Medical Statistician and his staff for their help.

The following comments and figures are quoted from the 1955 (calendar year) volume of medical statistics just published:

### *Hospital Administration*

In attempting to interpret the information collected from hospitals and to adapt it to the needs of hospital administration at all levels from that of national planning and policy to the running of a local hospital, the following four principal aims have been concentrated on:

- (1) To determine to what extent local conditions are responsible for differences in types of illness for which patients are admitted, and to assess the use made of hospital beds in different areas against the background of a varying pattern of disease in those areas, having regard to the age distribution and other characteristics of the population at risk.
- (2) To select certain groups of conditions that are likely to give some indication of the efficiency of a hospital in terms of the response to treatment and the length of hospitalisation which that treatment has entailed. A popular term for this nowadays is "medical auditing".
- (3) To shed light on the reasons for persons being kept in hospital for undue length of time.
- (4) To determine basic trends in hospitalisation and to make estimates of future needs for hospital construction in terms of changes in the population at risk and in the modes of therapeutic procedures.

### *Summary of Inpatient Statistics*

In the following table a summary is given of inpatients for the year 1955, by age and sex, showing comparisons of numbers of patients and length of stay in hospital. This analysis was first compiled for the year 1950, and certain figures for that year are included in the table to show the movement that has taken place in the various figures between 1950 and 1955.

It should be noted that admissions due to pregnancy, childbirth, or puerperal conditions are omitted from the 1950 figures. In 1955 all cases of complications of pregnancy or childbirth are included, together with a small number of normal delivery cases that occupied general beds in hospital.

*Table 23—Incidence and Prevalence of Hospital Experience by Age and Sex, 1955*

—	0-7	8-14	15-44	45-64	65 and Over	Total Males
(a) <i>Males</i>						
Number of patients .. ..	16,092	7,414	26,286	14,879	13,754	78,425
Days' stay in hospital .. ..	253,419	113,540	505,027	404,600	540,004	1,816,590
Average number of days' stay per patient .. ..	15.7	15.5	19.2	27.2	39.3	23.2
Number of patients per 1,000 persons in age group—						
1955 .. .. .. ..	79.2	53.5	59.3	74.1	153.2	72.9
1950 .. .. .. ..	81.7	63.6	62.8	72.7	131.1	74.2
Number of days' stay per 1,000 persons in age group—						
1955 .. .. .. ..	1,247	819	1,138	2,016	6,013	1,688
1950 .. .. .. ..	1,234	1,054	1,428	2,062	5,643	1,836
Percentage of total days in hospital of all persons .. .. ..	7.0	3.2	14.2	11.4	15.2	51.0

*Table 23—Incidence and Prevalence of Hospital Experience by Age and Sex, 1955—continued*

—	0-7	8-14	15-44	45-64	65 and Over	Total Females	Totals, Males and Females
(b) <i>Females</i>							
Number of patients .. ..	11,844	5,675	35,519	13,940	11,032	78,010	156,435
Days' stay in hospital .. ..	189,423	89,788	566,926	366,819	530,402	1,743,358	3,559,948
Average number of days' stay per patient .. ..	16.0	15.8	16.0	26.3	48.1	22.3	22.8
Number of patients per 1,000 in age group—							
1955 .. .. .. ..	61.1	42.7	82.6	68.8	106.6	73.4	73.1
1950 .. .. .. ..	63.4	50.8	62.1	62.9	88.3	63.7	69.0
Number of days' stay per 1,000 persons in age group—							
1955 .. .. .. ..	977	676	1,318	1,812	5,124	1,640	1,664
1950 .. .. .. ..	1,008	918	1,427	1,779	4,481	1,655	1,746
Percentage of total days in hospital of all persons .. ..	5.3	2.6	15.9	10.3	14.9	49.0	100.0

The number of patients treated has increased by 22,780, or 17.0 per cent, since 1950, with a corresponding increase in the total days' stay of all patients of 191,341, or 5.7 per cent.

The proportions of the population receiving inpatient treatment indicate that there has been an increase in 1955 as compared with 1950 in the age groups 45-64 and 65 and over for both males and females. By far the greater increase has occurred in the years of retirement (65 and over), indicating that more and more hospital bed space is being occupied by the elderly as the years go by.

By and large there has been an increase in the admission rate, coupled with an accelerated "turnover" of patients which has led to an overall reduction in bed occupancy since 1950.

#### *The Bed-time Index*

In the volume on medical statistics for the year 1953 a comparison was made between various hospitals in respect of the length of stay in hospital for a number of groups of conditions. A "bed-time" index was calculated to indicate the variation between hospitals in the length of stay of patients, condition by condition, and for the total stay from a variety of conditions.

*Variation Between Hospitals*

Having constructed this set of indices there remains the task of attempting to interpret them. It is worthy of mention that the figures for 1955 are similar to those of earlier years. This is a point of importance as it helps to dispel any doubts that the differences noted between hospitals are merely temporary. Only six out of the 25 hospitals covered by the table showed a change in 1955 from their former position as regards their classification as a hospital showing either a saving or an excess in the New Zealand average hospital days' stay for certain selected conditions although the order of saving or excess varied between the two periods.

By taking an average of the figures for the three years 1952, 1953, and 1955, it is possible to classify the hospitals in the following groups:

- (1) Saving of more than 20 per cent in hospital days ..... Grey.
- (2) Saving of more than 10 per cent but less than 20 per cent ..... Whangarei, Christchurch, Nelson.
- (3) Saving of more than 5 per cent but less than 10 per cent ..... Auckland, Southland, Dunedin, Rotorua, New Plymouth.
- (4) Saving of 5 per cent or less ..... Hutt, Masterton, Tauranga.
- (5) Excess of 5 per cent or less ..... Wellington, Green Lane, Napier, Wairau.
- (6) Excess of more than 5 per cent but less than 10 per cent ..... Wanganui, Cook.
- (7) Excess of more than 10 per cent but less than 20 per cent ..... Waikato, Palmerston North, Middlemore, Hastings.
- (8) Excess of more than 20 per cent ..... Oamaru, Ashburton, Timaru.

It would appear that a more detailed investigation into possible reasons for the excess group (5) to (8) above would be worth while.

#### 4. STAFF

The total of employees of all hospital boards and departmental hospitals (other than mental hospitals) at 31 March 1957 was 1,207 more than the year before. The number of nurses increased by 644, as against an increase of 167 only in the preceding year. The next largest increase in staff members was 356 in the domestic and other institutional staff. There are indications that recruitment of various classes of hospital staffs is becoming easier consequent on the larger number of young people becoming available for employment.

In the following tables the institutional staff employed at 31 March 1957 total 20,026 for the total of 15,939 beds in hospitals and old people's homes. Of these beds 12,161 were occupied daily and the staff engaged averaged 1·3 per available bed or 1·6 per occupied bed, as against 1·2 and 1·6 respectively in the preceding year. Nursing staff engaged averaged 0·8 per occupied bed compared with 0·7 a year earlier.

#### Staff Employed

The numbers of staff employed in public hospitals and other institutions and activities controlled by hospital boards and the Department at 31 March 1957 and the actual payments of remuneration for the

year which ended on that date, with the corresponding figures for the previous year in parentheses, were as shown below:

Table 24

	Numbers Employed at 31 March 1957	Salaries and Wages Payments for 1956-57
		£(000) £(000)
Institutional medical (whole time and part time) .. ..	1,201 (1,194)	1,021 (893)
Other professional and technical ..	1,346 (1,267)	822 (681)
Nursing .. ..	9,311 (8,667)	3,291 (2,834)
Other treatment staff ..	308 (304)	217 (207)
Domestic and other institutional staff (including maintenance and grounds)	7,860 (7,504)	4,280 (4,018)
Administration (mainly secretarial staffs)	478 (479)	368 (344)
District nursing .. ..	171 (150)	115 (92)
Farm (including vegetable gardening) ..	83 (75)	48 (47)
Miscellaneous (including architects) ..	181 (92)	111 (62)
	<hr/> <hr/> 20,939 (19,732)	<hr/> <hr/> £10,273 £(9,178)

### Medical Staff

The table below sets out details of medical staff both whole time and part time employed by hospital boards at 31 March 1958. The figures differ from those shown in Table 24 as positions temporarily vacant, staff employed in departmental institutions, sixth year students acting as house surgeons, and visiting medical officers not performing regular weekly hours are included in Table 24 but have been excluded from this table.

The hours of visiting medical officers have been converted to show the number of whole-time employees required to give an equivalent service.

Table 25

	Whole Time	Part Time	Whole Time Equivalent	Total
Medical administrators .. ..	46	22	11	57
Physicians—				
General .. .. ..	20	100	31	51
Tuberculosis .. .. ..	15	5	2	17
Others .. .. ..	6	52	14	20
Surgeons — .. .. ..				
General .. .. ..	16	95	29	45
Others .. .. ..	16	119	41	57
Pathologists .. .. ..	28	..	..	28
Radiologists and radiotherapists .. ..	27	29	11	38
Anaesthetists .. .. ..	17	120	28	45
Other medical staff .. .. ..	5	43	11	16
	<hr/> 196	<hr/> 585	<hr/> 178	<hr/> 374
Registrars .. .. ..	100	..	..	100
House surgeons and house physicians ..	173	..	..	173
	<hr/> 469	<hr/> 585	<hr/> 178	<hr/> 647

### House Surgeons and Registrars

For the past few years boards, particularly those in the smaller centres, have experienced considerable difficulty in filling house surgeon and registrar positions and on present indications no improvement in this situation appears likely in the immediate future.

In order to ensure an equitable distribution of available staff the Department has been obliged to rigidly control junior medical staff establishments and has, with the concurrence of the Medical Superintendents' Association, endeavoured to meet the more pressing staff problems by the direction of bursars.

However, with a decline in the number of bursars available it may be necessary to consider for the smaller hospitals the employment of part-time visiting staff in lieu of house surgeons and registrars.

### Overseas Post Graduate Medical Study Leave

Leave granted for refresher courses to be taken overseas in 1958 was as follows:

*Table 26*

Specialty						Number Granted Leave
Whole-time staff—						
Administration	..	..	..	..	..	1
Cardiology	..	..	..	..	..	1
Neuro-surgery	..	..	..	..	..	1
Radiology and radiotherapy	..	..	..	..	..	2
Anaesthetics	..	..	..	..	..	1
						— 6
Part-time staff—						
Ophthalmology	..	..	..	..	..	2
Medicine	..	..	..	..	..	1
Surgery	..	..	..	..	..	3
						— 6
						— 12

The amount involved in the payment of salary and assistance with fares is estimated at £12,775.

Since 1952 when the Overseas Selection Committee was appointed grants have been made to 41 whole-time officers and 55 part-time officers.

### Hospital Employment Regulations

The majority of salaries advisory committees met in 1957 but a decision on the recommendations made had not been reached at the date of this report.

The Dietitians Salaries Grading Committee which was established to deal with the salaries of senior dietary staff held its initial meeting during the year.

Apart from the larger occupational groups where conditions of employment are considered by special advisory committees there is a residual group of some 200 employees under the regulations employed in a wide variety of occupations.

A review, the first for some years, of the salaries of these employees was made last year and it is proposed to hold annual reviews in future.

## 5. HOSPITAL WORKS AND DEVELOPMENT

### Hospital Works Committee

This committee, created a statutory body with the passing of the Hospitals Act 1957, has been functioning now for four years. It continues to examine and suitably recommend upon all proposals for building work in excess of £10,000 in all stages of planning, and to exercise control on overall planning and programme of works.

During the past year the committee considered 189 projects, representing most elements of hospital building in various stages of planning.

### Planning Bases

As indicated in my last report, a planning base for hospital laboratories has been completed and distributed to hospital boards and others interested. While no further hospital elements have since been fully investigated the Division's officers are compiling in the course of current examination and planning discussions a quantity of information which it is hoped to incorporate in further planning bases issues.

### Hospital Building Works and Equipment

As indicated in Table 27 on page 62, a very considerable volume of work is either already in train or at some stage in planning to replace improve, or enlarge the facilities needed for an up-to-date hospital service for the Dominion.

The projects represented by the sums shown have without exception had the closest examination as to necessity of the work and quality of building and it must also be realised that the work at present in view (independent of the further demands of a steadily increasing population) will not all come to completion within probably the next 10 years. The programme now approved must therefore be regarded as no more than prudent, and must undoubtedly continue to expand as local development or the age and inadequacy of existing buildings dictate.

I give here brief details of some of the major works built, in building, or fairly advanced in planning for this year. Where patient beds are added the number is qualified by M (maternity), G (general), or H (old people's homes). In some instances the true total gain is less than the figure shown because, of replacement of substandard accommodation or the relief of existing overcrowding.

(1) Four new hospitals have been completed and opened this year – the new maternity hospital, which is the first stage of building at Westown, New Plymouth (40 M); and hospitals at Kaikohe (21 M), Te Awamutu (21 M), and Paraparaumu (15 M). In addition ward blocks have been completed and occupied at Thames (60 G), Rotorua (90 G), Taumarunui (22 G), Masterton (16 M), Palmerston North (40 M), and Kew, Invercargill (90 G). Nurses' home additions were finished at Whakatane, Burwood, and Balclutha, and other works were the kitchen block at Gore and the new rehabilitation centre at Otahuhu, the last named operated by the Auckland Hospital Board and built as a joint enterprise with the Department and the Workers' Compensation Board.

(2) Coming now to works in progress, the list includes the new maternity hospitals of 44 beds at North Shore, and 8 at Tuatapere (Southland) both almost completed; the first stage of Cashmere

Hospital, whose 256 general beds should be commissioned during the coming (1958-59) financial year; and the new National Women's Hospital in Auckland, upon which work has just started (274 M and G). Ward and/or clinical services blocks are building at Whangarei (180 G), Kaeo (6 G), Taumarunui (30 G), Whakatane (23 G), Te Puia (18 M), Wairoa (20 M, 30 G), Hastings (20 M, 90 G), Dannevirke, Westown (60 G), Wellington, Nelson, (110 G), Timaru (40 M), and Dunstan (30 G, 8 M). Nurses' home extensions are under way at Whangarei, Tauranga, Wanganui, Wellington, Nelson, and Oamaru; and ancillary services in building include boilerhouses at Green Lane, Thames, Hamilton, Taumarunui, Waipukurau, and Dunedin; and laundries at Thames, Westown, Wellington, and Dunedin.

(3) In addition it is expected that a start should be made before long on the following (among others), upon which planning is well forward or completed: New maternity hospitals at Eketahuna (5 M), Martinborough (5 M), Upper Hutt (30 M), and Lumsden (8 M); building at Rotorua (outpatients block), Middlemore (60 M), Tauranga (90 G), Dunedin (44 M), Balclutha, Cromwell (10 M), and Ranfurly (11 G), Wanganui Jubilee Home (30 H), Awapuni (45 H), and Lorne (Invercargill) (60 H); Nurses' home extensions at Timaru, Dunedin, and Ranfurly; a new boilerhouse at Hawera (with laundry); and laundry at Hamilton.

The following table was compiled from returns made and forecasts supplied by hospital boards, but the division is of opinion that, apart from the availability of loan finance, the forecasts are overoptimistic. I do not think that with the physical resources available the works can be completed or expenditure incurred as rapidly as the boards have estimated.

*Table 27—Hospital Works Programme as at 31 March 1958  
(Projects over £10,000 only\*)*

—	Total Estimated Cost	Expenditure up to 31 March 1957	Expenditure, 1957-58	Estimated Expenditure, 1958-59	Estimated Expenditure, 1959-60	Estimated Expenditure, 1960-61	To Complete
Category A	£12,765,285	£2,411,054	£2,320,990	£4,271,145	£1,805,390	£1,012,604	£944,102
Category B	304,229	..	21,440	219,270	63,519	..	..
Category C	731,784	..	1,881	284,341	188,167	100,000	157,395
	13,801,298	2,411,054	2,344,311	4,774,756	2,057,076	1,112,604	1,101,497
Category D	854,394	..	5,374	279,328	322,907	204,741	42,034
Category E	7,293,476	..	28,962	1,125,313	2,211,934	1,524,914	2,402,353
Category F	8,880,023	..	367	640,095	1,790,238	2,002,920	4,446,403
Category G	7,810,500	..	..	46,050	323,450	332,000	7,109,000
Totals ..	38,639,681	2,411,054	2,379,014	6,865,542	6,705,605	5,177,179	15,101,287

\* In addition, the total value of all projects £1,000 to £10,000 was £700,000 at 31 March 1958.

Category A = Work commenced.

B = Acceptance of tender authorised.

C = Tenders called.

D = Working drawings approved.

E = Sketch plans approved.

F = Preparation of sketch plans authorised.

G = Provisionally approved.

### Consents to Capital Expenditure

(1) *Buildings*—During 1957–58 ministerial consents were granted to hospital boards to undertake building projects (with 1956–57 figures for comparison) as follows:

*Table 28*

			1956–57 £(000)	1957–58 £(000)
Major works exceeding £20,000	..	..	1,735	5,776
Consents ranging from £10,000 to £20,000	..	..	227	367
Consents ranging from £5,000 to £10,000	..	..	218	319
Consents ranging from £250 to £5,000	..	..	367	412
			<hr/> <hr/>	<hr/> <hr/>
			£2,547	£6,874

The year's figures reflect the authorisation of major works discussed earlier in this section of the report.

(2) *Hospital Equipment and Furnishings*—In the same period approvals were issued to boards for the expenditure of £697,000 for items of equipment and furnishings costing more than £250, compared with £424,000 in the preceding year. These sums were made up as follows:

*Table 29*

			1956–57 £(000)	1957–58 £(000)
Motor ambulances, trucks and cars	..	..	60	26
X-ray equipment	..	..	55	75
Furniture, nurses' homes and staff accommodation		..	16	73
Ward equipment	..	..	72	39
Surgical and specialists' equipment	..	..	40	168
Laundry equipment	..	..	76	99
Hospital equipment, including dietary maintenance, and electrical stand-by plants	..	..	105	217
			<hr/> <hr/>	<hr/> <hr/>
			£424	£697

There is an increase of 64 per cent over approvals issued in the year before in which, however, there had been a decrease over the previous year.

The increases under surgical and specialists' equipment and hospital equipment reflect the requirements for commissioning new hospital buildings and modernising equipment in existing hospitals. Further increases can be expected as major works recently authorised reach the stage where ordering of equipment and furnishings must be undertaken.

The total amounts of capital consents for expenditure on equipment and furnishings in 1957–58, in the preceding year, and five years ago were as follows:

			£(000)
1953–54 ..	..	..	255
1956–57 ..	..	..	424
1957–58 ..	..	..	697

## 6. FINANCE

The actual expenditure of hospital boards and of Department of Health institutions in 1956–57 for both capital and maintenance purposes (inclusive of expenditure from loans but exclusive of amounts paid between boards or to Government institutions) totalled nearly £23 millions and is summarised thus:

*Table 30*

	1955–56			1956–57		
	Hospital Boards	Departmental Institutions	Total	Hospital Boards	Departmental Institutions	Total
Maintenance ..	£(000) 15,510	£(000) 456	£(000) 15,966	(£000) 17,073	£(000) 485	£(000) 17,558
Capital ..	4,536	40	4,576	5,415	15	5,430
<b>Total ..</b>	<b>20,046</b>	<b>496</b>	<b>20,542</b>	<b>22,488</b>	<b>500</b>	<b>22,988</b>

### **Maintenance Expenditure**

A summary of maintenance expenditure of hospital boards for 1956–57, with the figures for 1955–56 for comparison, is given below.

*Table 31*

	1955–56		1956–57	
	Amount	Percentage of Total	Amount	Percentage of Total
Hospital maintenance .. .. ..	£(000) 13,781	88·8	£(000) 15,147	88·7
Interest on loans .. ..	440	2·8	511	3·0
Indoor relief .. ..	273	1·8	302	1·8
Transport of patients (including grants) ..	161	1·0	166	1·0
District nursing (including grants) ..	156	1·0	180	1·1
Superannuation .. ..	117	0·8	126	0·7
Miscellaneous .. ..	110	0·7	124	0·7
Grants private hospitals, etc. .. ..	30	0·2	29	0·2
Outdoor relief .. ..	25	0·2	26	0·1
Administration .. ..	417	2·7	462	2·7
<b>Total .. .. ..</b>	<b>£15,510</b>	<b>100·0</b>	<b>£17,073</b>	<b>100·0</b>

Hospital maintenance expenditure remains steady at approximately 89 per cent, but the continuing increase in interest on loans should be noted. Five years earlier, in 1951–52 it was 1·9 per cent.

### **Inpatient Expenditure**

For the year 1956–57 the average daily expenditure for individual inpatients was £3 8s. 4d. or, in other words, with just over 11,300 patients in hospital, outgoings totalled £38,000 each day for resident patients. On the average, each inpatient cost £62 6s., as compared with £59 14s. in the previous year.

The daily expenditure per inpatient was made up of:

		1955-56			1956-57		
		£	s.	d.	£	s.	d.
Treatment expenditure—							
Salaries and wages—							
Medical .. .. ..	..	0	3	2	0	3	7
Nursing .. .. ..	..	0	12	11	0	15	1
Technical and other treatment staff .. .. ..	..	0	1	5	0	1	7
					0	17	6
Special departments (e.g., X-ray, laboratory) .. .. ..	..	0	1	11	0	2	2
Supplies and expenses .. .. ..	..	0	3	7	0	3	9
					0	5	6
Sub-total, treatment .. .. ..	..				1	3	0
Institutional administration .. .. ..	..	0	4	10	0	5	0
Heat, light, power, and water .. .. ..	..	0	5	7	0	5	10
Household (housekeeping, dietary, laundry) .. .. ..	..	1	5	1	1	7	2
Buildings and grounds .. .. ..	..	0	3	9	0	4	2
					1	19	3
Total daily expenditure .. .. ..	..				£3	2	3
					£3	8	4

The top rate of hospital benefits of 21s. per day which applied during the above years fell short of meeting the average daily direct expenditure for treatment. This deficiency and the maintenance and other non-treatment expenditure were met by Government grant and other (minor) income.

Inpatients now stay in hospital an average of 18 days and the total expenditure per inpatient is made up as follows:

		1955-56			1956-57		
		£	s.	d.	£	s.	d.
Treatment .. .. ..	..	22	0	0	23	18	0
Institutional administration .. .. ..	..	4	12	0	4	11	0
Heat, light, power, and water .. .. ..	..	5	8	0	5	7	0
Household .. .. ..	..	24	0	0	24	14	0
Buildings and grounds .. .. ..	..	3	13	0	3	15	0
Miscellaneous .. .. ..	..	0	1	0	0	1	0
					£59	14	0
					£62	6	0

### Outpatient and Dental Expenditure

Outpatients numbered 693,000 and the average expenditure per outpatient was £1 13s. 11d. There were over 38,000 dental outpatients and the average expenditure was £1 9s. 5d. per case.

### Control of Expenditure

Institutional maintenance expenditure figures have now been presented in the above form, i.e., in divisions in accordance with the main activities of our hospitals, for three financial years. With the comparative figures on a uniform basis now available, valuable information for control of expenditure is at hand. Trends can be discerned and pointers are given which will materially assist hospital boards and controlling officers to discover where the rate of expenditure is above average or is increasing too rapidly. The presentation is such that the actual expenditure for which each controlling officer is responsible is indicated and enables their cooperation to be obtained in the control of expenditure.

The present financial climate strongly suggests that the national hospitals system will have to justify its rising costs fully to ensure that the funds required are voted by Parliament. Hence it will be essential to demonstrate that funds voted have been spent to best advantage and that the closest supervision is exercised over all expenditure to ensure that full value is received.

### Government Grants

Payments to hospital boards by Government are now termed grants. Actual payments to boards in 1957-58 amounted to £15,390,000, comprising £12,757,000 for maintenance and £2,633,000 for capital purposes. The estimate for 1958-59 is £16,000,000. The balance of hospital board expenditure is met from Social Security Fund and from loan moneys raised by the boards for major capital construction.

### 7. PRIVATE HOSPITALS

The policy of encouraging the establishment of new private hospitals and the extension of existing ones was continued during 1957. The extent to which financial help has been given under the suspensory loan system is shown in the following table:

*Table 32*

Year	Loans Granted		
	Non-suspensory	Suspensory	Total
1954 .. ..	£ 60,910	£ 195	£ 61,105
1955 .. ..	139,923	8,745	148,668
1956 .. ..	345,510	36,980	382,490
1957 .. ..	537,610	130,470	668,080
Total ..	1,083,953	176,390	1,260,343

Two ways in which the licensing of private hospital beds serves the community are (1) by providing hospital beds available for use by patient attended by the doctor of his choice at a lower cost to the State than if the same number of beds were provided in public hospitals; and (2) by making available hospital beds which may be regarded as providing a means whereby a greater number of medical specialists are able to maintain up-to-date skill in their specialties than could be employed in public hospitals.

Without this policy of lending money to private hospitals it is considered the number of licensed beds would fall rapidly year by year.

At the end of 1957 calendar year the following was the position regarding the private hospital bed state. The corresponding values for 1956 calendar year are given in parentheses.

Table 33

Type of Hospital		Number of Hospitals	Number of Licensed Beds
Maternity .. ..	..	31 (36)	274 (303)
Medical and surgical .. ..	..	51 (51)	978 (953)
Medical .. ..	..	58 (56)	801 (753)
Mixed .. ..	..	9 (9)	444* (440)
Total .. ..	..	149 (152)	2,497 (2,449)

\* Consists of 107 maternity beds and 337 medical and surgical beds in 1957 and 106 maternity beds and 334 medical and surgical beds in 1956.

The figures indicate the net results after some hospitals have closed and new ones have opened.

At the end of 1957 there was still a trend for the number of maternity hospitals and licensed maternity beds to fall: the number of medical and surgical hospitals had been stable for a year after a slight increase but the number of licensed beds continued to rise: the number of medical hospitals continued to rise, with a marked increase in the number of licensed beds: The mixed hospitals had not essentially changed.

The state depicted in the table might significantly change when it is noted that current proposals involve three new maternity hospitals containing in all 31 beds, the re-establishment of another with 15 beds, an extension to a medical and surgical hospital of 15 beds, and two new medical hospitals involving 19 beds.

The administration of private hospitals has now become the responsibility of the Division of Hospitals, bringing a closer integration of private- and public-hospital bed provision and should produce a greater overall efficiency by ensuring that as far as is possible sufficient hospital beds of the appropriate type are provided where they are required. The responsibility for head office administration of private hospitals in the earlier part of the year was delegated to Dr I. J. Jeffery, one of the assistant directors of hospitals, but in the latter part of the year was delegated to the three assistant directors who assumed responsibility for both public and private hospitals in their respective regions.

The medical officers of health continue to be responsible for district administration.

## 8. AMBULANCE SERVICES

### Ambulance Transport Advisory Board

During leave of absence granted to Mr W. E. Bate whilst overseas, Mr J. F. Thompson, Chairman of the Wairarapa Hospital Board, and Vice-President of the Hospital Boards' Association, acted as deputy and attended two meetings of the board.

The board meets quarterly and there are therefore numbers of occasions when members must be consulted by letter. I appreciate the ready help and advice given by them and also appreciate the special assistance of the Board's Working Committee which met on five occasions during the year.

On 1 April 1957 Mr R. R. Olen, who had served the Department for five years as Ambulance Advisory Officer, retired. I desire to record our keen appreciation of the service rendered by Mr Olen to ambulance transport in the Dominion.

### Scope of Service

Road ambulance services now operate from 93 stations throughout the Dominion, there being 173 vehicles in use. Of these, 123 are run by subsidised voluntary agencies and 50 by hospital boards. There are in addition some 15 ambulance vehicles operated by Ministry of Works and other Government agencies; Air Department has 12 ambulances and Army Department 3 civilian-type (besides Army-type vehicles), most of them available in emergency for general civilian cases.

Special credit is due to the Order of St. John for the large volume of service provided in the Auckland, Waikato, Canterbury, Otago, and other districts, and to the Wellington Free Ambulance for its service in Wellington district. It is not always appreciated that apart from raising substantial sums towards the cost of the service the voluntary agencies provide a very considerable amount of honorary services. This is something to be fostered and encouraged in every way.

### Charges Policy

The charges policy settled upon in 1956 divided road ambulance services into three categories summarised as follows:

Category A—Transfers of patients between public hospitals. These are non-chargeable so far as patients are concerned and where a subsidised organisation provides the service the hospital board requesting the service is to reimburse the organisation the full cost.

Category A services are very considerable in the populous centres and, overall, constitute about 45 per cent of the total services.

Category B—Standby services for sports and other bodies, and also transport of patients for personal reasons, i.e., not medically necessary. For these services the full cost is to be recovered from users. Sports bodies usually meet this cost by donations.

Category B services constitute less than 5 per cent of overall total services.

Category C—Transport to hospital from patients' homes or from the site of an accident, or transfers between private hospitals. Generally, all services not in Categories A or B. For these cases hospital boards and subsidised ambulance organisations are to make the standard charge, provided that a subsidised organisation desiring to maintain a free service could do so if it collected voluntary contributions for that purpose equal to the product of standard charge.

The standard, as recently modified, is 12s. per patient carried plus 1s. per mile for the distance the patient is carried (maximum milage charge 18s.) with a maximum overall charge per patient-journey of 30s.

All of the 21 hospital boards who conduct ambulance services themselves and eleven subsidised organisations operate the standard charge. Ten subsidised organisations operate a free service in continuation of their previous policy, but one or two of them may be forced to impose charges because of insufficient voluntary support. The general result of the policy is to accord reasonably uniform treatment to the various classes of users. Heavy charges no longer operate in some areas whilst, in other areas, free services as previously enjoyed had been allowed to continue provided sufficient voluntary contributions were raised, but nevertheless largely at the expense of the general taxpayer.

### Finance

Grants made by hospital boards to subsidised organisations as their agents during the year amounted to £136,315 for maintenance purposes and £7,997 for capital purposes, the latter mainly towards the cost of replacing old vehicles in small centres. The number of vehicles purchased or replaced in this group was 10, and one grant was made towards the cost of a garage. Ambulance services operated by hospital boards involved expenditure of £46,931 (1956-57 figures) for maintenance, and £6,832 was authorised to be spent on the replacement of vehicles (four).

The total annual charge on the Consolidated Fund for road ambulance services would appear to be stabilised at about £200,000.

Grants to subsidised organisations are made only after examination of their financial position, and the general experience is that a constant eye is kept to economy of operation. In respect of replacements the board has the technical advice of the Transport Department's officers whenever required and has found them always helpful.

In future, standardised annual accounts and statistical returns are to be obtained from all ambulance agencies, both hospital board and voluntary, and details will then be published in subsequent reports.

### Air Ambulance Services

Arrangements made for air ambulance services are working smoothly and the Ambulance Transport Advisory Board is grateful for the co-operation of the Civil Aviation Administration in the licensing of aircraft for air transport of patients. During the calendar year 1957 the number of cases transported by air was 467, some of which were taken by normal airline services. So far, besides NAC planes, three aero club aircraft have been approved for carrying stretcher cases and other applications are under action. To provide a wider distribution of approved aircraft, efforts will be made to encourage more operators to have their machines modified as necessary to undertake this type of work. Appreciation is again expressed of the help given by the RNZAF ambulance service during the year in meeting emergency calls.

Under the auspices of the Standards Institute a committee is engaged on formulating a standard set of interchangeable air/road ambulance equipment to facilitate transfers of patients.

### Future Policy

The subject of ambulance personnel training is under consideration and it is hoped that a conference of ambulance operators can be arranged in the near future to consider this in detail.

## 9. INSPECTION AND ADVISORY SERVICES

During the year an active programme of inspection of all aspects of hospital board activities, including ambulance services has been continued by officers of this and other divisions of the Department. The Director-General and I made five special tours each of about two weeks' duration inspecting a large number of institutions and meeting members and officers of boards for discussion of local problems. Building and development proposals and medical activities have been inspected by the three assistant directors of this division; nursing activities by the inspectors of the Nursing Division; architectural problems and engineering services by the Department's architect and his staff and its advisory engineer, and dietary and physiotherapy departments by the Inspecting Dietitian and Inspecting Physiotherapist respectively.

The Department's dietary advisory service covering all aspects of institutional catering has expanded. Other Government Departments, social and welfare organisations, and industry have also sought from this unit help and advice in a wide variety of problems encountered in group catering.

Several pathologists from the larger hospitals continue to inspect and report annually to the Department on the laboratories at the other hospitals throughout New Zealand, and their services are of great value to this division.

The division also obtains valuable inspection reports on maternity hospitals from nurse inspectors attached to the Department's district offices.

In the administrative and accounting field the Advisory Officers and Advisory House Manager have inspected 15 hospital Boards during the year and their programme of inspection covers all the administrative services and activities. During the year policies and systems involved in the mechanisation of financial and stores accounting and payroll (involving the application of PAYE) were completed and information to enable boards to proceed on uniform systems was issued. This project and the examination of subsequent detailed proposals from hospital boards for mechanisation has meant a great deal of work for the advisory officers, but a substantial number of boards are now proceeding to mechanise their systems on the lines recommended and this will result in significant improvements in administrative efficiency.

## 10. GENERAL

During the year Dr V. S. Land, who was previously Medical Superintendent of Otaki Sanatorium, was appointed as a Third Assistant Director to the Division. His appointment has enabled the reorganisation of both the medical and architectural services of the Division into three regions, northern, central, and southern, and the close and continuing association at Head Office of an Assistant Director and an architectural staff on the problems of a particular region will be of great assistance in our administration.

The staff of advisory officers and advisory house managers is below approved establishment. Officers of special experience and qualifications are required if the division is to carry out its full programme of inspection and advisory work in the administrative fields and efforts are continuing to secure suitable appointments.

### Conclusion

With the preparation of the new Hospitals Act which passed through Parliament last year and necessary arrangements for its provisions and regulations thereunder to come into operation from 1 April 1958, the year has been a strenuous one. I desire to thank all the officers of my division most sincerely for their valuable and loyal service during the year. I am appreciative of the cooperation given by other divisions of the Department and also wish to record my special appreciation of the counsel and assistance of the Director-General of Health.

C. A. TAYLOR,  
Director, Division of Hospitals.

## REPORT OF DIRECTOR, DIVISION OF NURSING

### NURSES AND MIDWIVES BOARD

During the year an amendment to the Nurses and Midwives Act 1945 was passed by Parliament and came into force on 3 October. The amending Act made certain significant changes.

The board was given power to include training and instruction in maternity nursing in the basic nursing training. This means that at the conclusion of a three-year period of training the nurse of the future will qualify for registration as a nurse and a maternity nurse. The six-months' training in obstetrics for a girl already registered as a nurse, and the eighteen-months' training for the unregistered woman will still be continued.

The age at which a nurse and a male nurse may register has been lowered to 20 years, and that of a nurse aid to 18 years. Psychiatric nurses who previously could sit the State Final Examination at 20, but who could not register until they were 21 years of age, will now sit and register at the age of 21. The age of registration for maternity nurses and midwives has not been changed.

Curricula for all categories of nurses have been revised and the majority of training schools report that these have been successfully instituted.

The board has been granted wider powers in regard to registration in that it can now decline to register any person who, in its opinion, is not of good character and reputation.

Its powers to recognise periods of previous training in reduction of prescribed course of training or instruction for registration in any capacity are also widened by an amendment under which regulations may be made to provide for the modification of any period of training in respect of persons or classes of persons who are registered in any other capacity or who have undergone the whole or any part of any period or course of training or instruction. This means that the board may now grant concessions which in the past it felt it should grant but because of lack of provision in the Act was unable to do so.

The regulations under the Nurses and Midwives Act are being consolidated, which will make their interpretation more straightforward in the future. Provision is being made for the issue of supplementary instructions relating to the various categories of trainings under the jurisdiction of the board in guide form which enables explanatory details to be given in the methods of teaching and in regard to examination. Curricula for nurse, male nurse, nurse aid, and psychiatric nurses have all been revised and have been planned to give greater conformity in relation to concessions in training granted by the board.

Mrs D. I. Milne resigned from the board last year and was replaced by Miss G. Boyd. Miss I. M. Henderson also resigned but her successor has not yet been appointed.

## NURSE TRAINING SCHOOLS

This year there is again a slight increase in overall staffing despite the fact that 855 discontinued training during the year. Of these, 420 discontinued in their first year and 291 in the third and fourth year. It is possible that many in the latter category went on to undertake maternity training and it is to be hoped that the new curriculum will prove to be a means of considerably reducing the number who leave in the first year. There are 158 Maori girls undergoing nursing training, 25 Pacific Islanders, and 31 of other races. The total increase in nursing staff was 808, as compared with 500 last year, and this number spread over the training schools must have some influence over the small number of beds now unoccupied due to shortages of nursing staff. The ratio of registered staff to student nurses is 1 to 2·4, and the ratio of full-time nursing staff to average patients nursed is 1 to 1·2.

## MALE NURSE TRAINING SCHOOLS

There are at present 33 male nurses in training, which shows a decrease on last year's figures, five having discontinued training during the year. The male nurse training is now of three-years' duration. The board is holding a special examination in 1958 for those nurses already registered to enable them to have the same status as those who will qualify in the future under the new syllabus. It is hoped by extending the period of training and reducing the age of registration that more men with high academic education will be attracted to the nursing profession.

## NURSE AIDS

There are at present 248 nurse aids in training, 64 of whom are Maori girls. The new syllabus of training has been planned to correspond in theory and practice to that undertaken by the nurse in her first year of training. The six-months' concession on nurse training granted to a registered nurse aid still applies. The ratio of total nursing staff to patients in these schools is 1 to 2 and the ratio of registered staff to nurse aids is 1 to 1·3.

## OBSTETRICAL TRAINING SCHOOLS

### Midwifery Schools

The total number of midwives in training this year shows a considerable increase on last year's figures. This means that an additional number of nurses will be available for staffing in obstetric training schools.

### Maternity Schools

There was also an increase in the number of registered nurses undertaking maternity training, while the number of unregistered women is only one less than last year.

There are 1,414 beds available in obstetric training schools, in which 30,081 confinements took place this year. It is usually estimated that 20 patients per year occupy each bed with an average stay of 10 days. Figures for this year would indicate that the length of stay of patients in our training schools is much less than in previous years.

### NURSES POST-GRADUATE SCHOOL

Sixty-three students completed the course. Of these, six were overseas students from East Pakistan, Lebanon, Taiwan, Vietnam, Philippines, and Australia.

The course in paediatric nursing was successfully introduced and five students graduated in this course.

Miss J. Alley retired at the end of the year and has been replaced by Miss D. Pedersen; Miss A. Cathie was appointed as acting instructor and is in charge of the Paediatric Nursing Course.

### IMMIGRANT NURSES

A total of 104 immigrant nurses came to New Zealand during the year. The number of these nurses appears to be slowly decreasing and it would seem that this scheme as a means of trying to supplement the staffs of hospitals is reaching the stage when it will be no longer necessary.

### HEALTH OF NURSING STAFF

There was a high incidence of influenza amongst the nursing staff last year. This was only to be expected as the disease was very prevalent throughout the country during the late autumn months. The incidence of boils and septic fingers is still fairly high but infectious diseases of all types remain low. Only one case of pulmonary tuberculosis was reported, which shows the value of the careful supervision of the health of nursing staff from the day the nurse first enters as a student. Glandular fever, which reached high levels some years ago, is now very low on the list. Burns and scalds, however, though not so great in number as in past years, are still too high, and research directed towards causes could possibly result in the elimination of these preventable conditions.

### PUBLIC HEALTH NURSING

The year has seen a further step forward in the evolution of our public health nursing programme. For the last five or six years, during which the content of the public health nurses' work has been changing, it has been noticed that nurses in some areas have received fewer and fewer emergency calls and the recent job analysis of the work of public health nurses bore this fact out.

Previously, in some of the largely predominantly Maori areas of a semi-rural nature, it was customary for the nurse to be called at all hours of the day or night to give advice and help in cases of sickness or emergency. Today, with better methods of transport, medical advice more readily available and, not least, as a result of health education over many years, in some areas the nurses have ceased to receive any calls at weekends. Consequently, from a staffing point of view, it has now been found no longer necessary to term these districts as rural and four such districts have recently been designated city areas, which means we are no longer responsible to provide free accommodation for the nurses in those areas. It is anticipated other areas will be the subject of review during the next twelve months.

Recruitment during the past year has improved. This has resulted in a more stable staff with fewer long-term vacancies in most health districts. The type of nurse coming forward for this branch of nursing is, however, younger and consequently has had less experience on joining the staff than it was customary to accept in the past. This has meant added work and responsibilities for nurse inspectors who have had to give more help and support and more constant supervision to these young nurses, often in isolated areas, than would perhaps have been needed for the more mature nurse who was previously appointed. Of the 23 new appointments approved in 1955 only three have not yet been made.

The year has been a particularly busy one for both nurses and nurse inspectors who, due to the poliomyelitis immunisation campaign, have had to carry extra work loads. The work the poliomyelitis immunisation entailed has been immense. All staff have done this work willingly and I consider are to be congratulated on the way they planned their programmes so that their routine work did not suffer unduly and their case loads were reasonably well covered during the campaign.

The new curriculum for basic training of nurses, which integrates public health, has entailed added responsibilities for both nurse inspectors and public health nurses. They have nearly all been involved one way or another with the planning of the nurses' field work and the majority have taken student nurses out into the field with them. Some have given lectures to the students in the nursing school. It would appear that the public health nursing staff is carrying out its responsibilities for teaching preventive health work in the field very satisfactorily.

The integration of industrial nursing in the generalised programme of the public health nurse is proceeding slowly. While some areas are including this aspect of nursing very well others appear to be more hesitant. As recruitment improves and nurses case loads can be reduced to more workable proportions, a further integration of the industrial side will undoubtedly be included.

During the last few months floods in the centre of the North Island and West Coast of the South Island have caused inconvenience and worry to several of our nurses. It is with pleasure that I am able to report that the nurses concerned showed that ingenuity, initiative, and devotion to service which have always been traditional in our public health nurses.

### ISLANDS SERVICE

Applications to join this service have at times reached very low levels. The two-year term of contract at the commencement of service in some territories would seem to have a detrimental effect on recruitment. Where nurses can join for one year with a right of renewal for a second year it seems to be more attractive and no difficulty has been experienced in obtaining staff where these conditions apply. Nurses from the Island Territories who are accepted for training in New Zealand are often reluctant to return when training is completed, therefore the secondment of New Zealand nurses to the South Pacific will need to be continued in order that the people in this area can be assured adequate nursing care.

**GENERAL**

I wish to thank the matrons and senior staff who have retired this year after completing 30 years or more of nursing service for their long years of service to the nursing profession and to wish new appointees happy and successful term of office.

During the year the recipients of honours conferred by Her Majesty Queen Elizabeth II were: Miss C. M. J. Wylie, O.B.E., and Miss R. Trafford, M.B.E.

In conclusion, I wish to place on record my grateful thanks to the staff of my division, both professional and clerical, for their continued loyalty and devotion to duty and to assure them that their combined efforts make a valuable contribution to its successful functioning.

F. J. CAMERON,  
Director, Division of Nursing.

## REPORT OF DIRECTOR, DIVISION OF CHILD HYGIENE

### STAFF

The number of medical officers working for the division is the same as last year, namely, 21 whole time and 20 part time. The time given by the part-time medical officers was equivalent to that of eight full-time officers. This number is quite insufficient to provide adequate medical inspection of the child population of this country, which was estimated to be 722,284 in 1957, as compared with 697,037 for 1956 and 679,454 for 1955. Figures for the year, which are of course influenced by the poliomyelitis immunisation programme, show that only about one-sixth of these children were seen. As it is the aim of the division for each child to be seen four times – twice in the pre-school period and twice in the primary-school period – it is obvious that the coverage is poor. It is relatively easy to secure medical officers for work in urban and relatively populous districts, but the problem of supplying adequate medical supervision to the widely scattered rural populations who need it most remains very difficult. It speaks well for the interest and enthusiasm of the present medical officers whose areas include these scattered rural populations that they accomplish so much. It is proposed, therefore, to consider various projects which will economise the medical officers' time and enable the rural areas to be more satisfactorily catered for.

### MEDICAL WORK AMONG PRE-SCHOOL CHILDREN

The importance of good medical inspection work among the pre-school group of children is borne out by the statement of one medical officer, after examining new entrants to a school, that there is a noticeable difference between the physical condition and outlook of a child who has attended a pre-school clinic and that of one who has not had that advantage. This is partly due to the fact that mothers who take the trouble to bring their children to pre-school clinics are probably more suitable mothers than those who do not. Much of this benefit, however, derives from the opportunity afforded to medical officers and nurses of giving helpful advice and guidance to the child's mother when she attends a pre-school clinic, as much as to the detection in the child of early aberrations from normal health. It is unfortunate, therefore, that no suitable buildings for this work exist except Plunket clinics. The latter are mostly in populated districts and do not cater for Maori children – a group of the population who most need such help and advice. Facilities for giving special advice to mothers, without the conversation being overheard by others waiting to see the doctor, are really essential if mothers are to be encouraged to attend these clinics.

Figures for the last few years show that only about half the pre-school children are seen at these clinics. In passing, it may be noted that last year's figures are abnormal owing to the normal programme of nursing and medical inspection being curtailed because of the necessity of carrying out the poliomyelitis immunisation programme.

All medical officers report on the great assistance and cooperation they receive from the Plunket nurses in their work. It is to be hoped, however, that the public health nurses will eventually be given similar facilities to carry out their work in areas where the sparsity of European population precludes the establishment of plunket clinics.

As before, great emphasis is now being placed on the discovery of hearing loss in these young children. Medical officers of the division attended a demonstration given by Miss E. M. Pickles, of the Department of Education at the Sumner School for the Deaf, of methods of detecting unsuspected hearing losses in very young babies. As the result of this, many cases of hearing loss have been picked up at pre-school clinics.

### MEDICAL WORK WITH PRIMARY-SCHOOL CHILDREN

The numbers of European children seen routinely at school during the past year have been somewhat adversely affected by the poliomyelitis immunisation programme, but there was an increase of 700 in the number of Maori children examined. It is pleasing to report that an increasing percentage of mothers attend the medical examination of their children at school. Not only do they receive benefit from advice and guidance from the nurses and medical officers, but they in their turn contribute to the efficiency of the examination by supplying details of the medical history of the child. Apart from vision and hearing, it is on the whole rare for any serious physical defect which is not already under treatment or observation to be found at these inspections, but cases of maladjustment, emotional disturbances, and psychological abnormality are frequently brought to light after discussion with the parents or teachers. The facilities for adequate medical examination in some schools are poor, and even in the more modern schools the medical room has to serve other functions when not actually in use for its proper purpose. In many cases, without the kind cooperation of the headmaster, it would be impossible to carry out any worth-while examinations at all. In many cases they are prepared to make available their own office or their staff rooms. Some even go so far as to provide facilities for the pre-school children in the area to be seen, and this help is very much appreciated.

As far as physical defects are concerned the most numerous are those due to upper respiratory infection, which is largely responsible for the development of malposture, the hearing losses, the deformed mouths, and hollow chests.

### CHILD HEALTH CLINICS

These clinics continue to increase in popularity and during the year arrangements for the opening of a new clinic of this kind at Palmerston North were completed and the clinic is expected to open early in 1958. The increased emphasis on the less easily diagnosable and treatable complaints associated with emotional disturbance and psychological maladjustment is making the provision of these clinics with a team of experts more and more necessary. In Christchurch Dr Cook has been appointed as a member of the Child Health Clinic team and the effects of this appointment on the work of the clinic will be watched with interest.

## GENERAL MATTERS

The work carried out by the division's medical officers and nurses in immunising approximately 200,000 children against poliomyelitis calls for special mention. Considerable assistance in this work was received from general medical practitioners, to whom the thanks of the Department are due. Great help was also received from school teachers. In addition to the children some 19,000 adults, pregnant mothers, and others specially at risk, were immunised by the division's medical officers. It is satisfactory to record that not a single serious reaction occurred although there were several minor ones due to psychological disturbance, allergy, or unsuspected co-existent illness.

During the year an Audiology Clinic was initiated to meet the needs in the Auckland area of deaf children. A hearing survey carried out previously had revealed the presence of considerable numbers of deaf children for whom no adequate service was available. Previously, all suspected deaf children were referred to the School for the Deaf, whose principal, Mr Allen, visited and tested for hearing loss. No specialist otological service was available and the whole scheme lacked coordination. The clinic now consists of a specialist otologist, the headmaster of the School for the Deaf, a medical officer who has specialised in deafness, and a social worker. Paediatric examination is available if required at the Child Health Clinic or from the family doctor. Nurses, private practitioners, medical officers, and teachers can all refer children with suspected hearing loss to this clinic where a complete diagnostic, assessment, treatment, and guidance service is available.

It is hoped to extend the service of this clinic to other areas outside Auckland. As has been pointed out in previous annual reports the prevalence of chronic otitis media among the Maori population is as great as ever. Dr Griffin, medical officer for the Rotorua Health District, has been appalled at the incidence there and she is only echoing reports from other medical officers in predominantly Maori districts. The problem is a difficult one and the establishment of a hearing conservation service which will provide means to treat and prevent the occurrence of otitis media in the Maoris is badly needed.

The diagnosis of deafness in very young children – provided that there are adequate means of treating and training the discovered cases – is now recognised to be of vital importance if these children are to learn to speak as normal children and to take their places in ordinary schools. While overseas during the greater part of the year I saw what was being done with success in this respect by many workers both in the United Kingdom and the United States.

During the year approximately 2,100 training college candidates and 350 dental nurse students were examined by medical officers of the division. The time consumed in this work, as mentioned in last year's report, was very considerable and detracted from the time available for the examination of children. The matter has been discussed with the Department of Education and the Division of Dental Hygiene with a view to this work being discontinued.

Many medical officers are concerned with the large number of adopted children who are found to have defects – not only physical but also psychological ones. Whether these are due to unsuitable parent-child relationships or whether they are due to inherent traits of the

child himself is a moot point. One instance is described of a highly intelligent child, adopted by parents with a poor intellectual background and living in the country, becoming a frustrated "problem" child. This no doubt is an exception but it points out the necessity for the greatest care being exercised not only in the examination of the child to be adopted but also in the assessment of the "adoptive" parents as to their capability and suitability to bring up and educate the adopted child.

I was absent overseas on a study tour during nine months of the year and the care of the division was in the hands of Dr G. O. L. Dempster, to whom I am indebted for his excellent supervision in which he was very ably assisted by the Section Clerk of the division. I would also like to express my appreciation of the good work done by the medical officers, nurses, and clerical staff working for the division in carrying out, without a hitch, the intensive poliomyelitis immunisation programme in addition to their normal work.

Finally, I should like to acknowledge with thanks the help and assistance received from family doctors, hospital specialists, the officers of the Department of Education and the Education Boards, and the nurses of the Plunket Society.

G. A. Q. LENNANE,  
Director, Division of Child Hygiene.

Table 34—School and Pre-school Children, 1957

	SCHOOL CHILDREN				PRE-SCHOOL CHILDREN (Including Plunket Examinations)			
	Europeans		Maoris		Europeans		Maoris	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Children examined .. ..	85,714	..	8,944	..	21,780	..	393	..
Children found to have defects .. ..	7,952	9.28	1,272	14.22	2,395	11.00	64	16.28
Children showing evidence of defects—								
Defects in general condition—								
Fair .. ..	138	0.16	31	0.34	36	0.17	4	1.02
Bad .. ..	73	0.09	22	0.25	39	0.18	5	1.27
General uncleanliness .. ..	21	0.02	8	0.09	1	..	..	..
Other .. ..	197	0.23	25	0.28	47	0.21	..	..
	429	0.50	86	0.96	123	0.56	9	2.29
Skin conditions—								
Impetigo .. ..	107	0.12	49	0.55	27	0.12	4	1.02
Scabies .. ..	10	0.01	44	0.49	1	..	1	0.25
Pediculosis .. ..	8	0.01	41	0.46	..	..	..	..
Eczema .. ..	80	0.09	7	0.08	119	0.56	2	0.51
Other .. ..	290	0.35	52	0.58	105	0.48	2	0.51
	495	0.58	193	2.16	252	1.16	9	2.29
Eyes—								
Refractive error untreated .. ..	1,909	2.23	140	1.56	18	0.08	2	0.51
Refractive error treated .. ..	479	0.56	19	0.21	6	0.03	..	..
Squint untreated .. ..	115	0.13	8	0.09	98	0.45	..	..
Squint treated .. ..	183	0.21	1	0.01	113	0.52	..	..
Other .. ..	145	0.17	22	0.25	50	0.23	..	..
	2,831	3.30	190	2.12	285	1.31	2	0.51
Ears—								
Otitis media with little or no impairment of hearing .. ..	22	0.03	67	0.75	7	0.03	2	0.51
Otitis media with impairment of hearing .. ..	109	0.13	127	1.42	17	0.08	1	0.25
Other impairment of hearing .. ..	308	0.35	57	0.64	25	0.12	3	0.77
Other .. ..	18	0.02	16	0.18	1	..	..	..
	457	0.53	267	2.99	50	0.23	6	1.53
Mouth, nose, and throat—								
Unhealthy tonsils .. ..	1,217	1.42	123	1.38	417	1.91	4	1.02
Nasal disease or defect .. ..	148	0.17	12	0.13	58	0.27	..	..
Adenoids .. ..	94	0.11	9	0.10	49	0.22	1	0.25
Untreated dental caries .. ..	873	1.02	283	3.16	296	1.36	18	4.59
Other diseases of teeth and gums .. ..	88	0.10	17	0.19	37	0.17	..	..
Other .. ..	44	0.05	6	0.07	8	0.04	1	0.25
	2,464	2.87	450	5.03	865	3.97	24	6.11
Goitre—								
Incipient .. ..	62	0.07	2	0.02	2	0.01	..	..
Other .. ..	25	0.03	1	0.01	9	0.04	..	..
	87	0.10	3	0.03	11	0.05	..	..
Speech, nervous system, psychological—								
Stuttering or stammering .. ..	243	0.28	25	0.28	95	0.45	..	..
Enuresis .. ..	303	0.36	9	0.10	92	0.42	1	0.25
Other behaviour or emotional problems .. ..	186	0.22	6	0.07	86	0.39	..	..
Impaired intelligence .. ..	148	0.17	35	0.39	49	0.22	2	0.51
Epilepsy .. ..	37	0.04	8	0.09	9	0.04	..	..
Other .. ..	13	0.02	1	0.01	5	0.02	..	..
	930	1.09	84	0.94	336	1.54	3	0.76

Table 34—School and Pre-school Children, 1957—continued

	SCHOOL CHILDREN				PRE-SCHOOL CHILDREN (Including Plunket Examinations)			
	Europeans		Maoris		Europeans		Maoris	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Children showing evidence of defects— <i>contd.</i>								
Orthopaedic, musculo-skeletal system—								
Flat foot .. .. ..	127	0·15	16	0·18	126	0·57	1	0·25
Hallux valgus .. .. ..	53	0·06	..	..	1	..	..	..
Club foot .. .. ..	39	0·05	11	0·12	84	0·39	..	..
Other orthopaedic conditions of lower limb(s) .. .. ..	165	0·20	34	0·38	222	1·02	5	1·29
Curvature of spine .. .. ..	47	0·05	4	0·04	9	0·04	1	0·25
Residual paralysis following poliomyelitis	38	0·04	7	0·08	8	0·04	..	..
Other residual paralysis .. .. ..	41	0·05	5	0·06	24	0·11	1	0·25
Postural defects not due to the above conditions .. .. ..	82	0·10	4	0·04	23	0·11	..	..
Other .. .. ..	47	0·05	6	0·07	22	0·10	..	..
	639	0·75	87	0·97	519	2·38	8	2·04
Heart (including cardio-vascular system)—								
Congenital heart disease with no impairment of function .. .. ..	50	0·05	8	0·09	47	0·22	..	..
Congenital heart disease with impairment of function .. .. ..	28	0·03	..	..	11	0·05	..	..
Rheumatic heart disease with no impairment of function .. .. ..	5	0·01	6	0·07	..	..	..	..
Rheumatic heart disease with impairment of function .. .. ..	6	0·01	9	0·09	1	..	..	..
Heart disease unspecified .. .. ..	39	0·05	8	0·09	78	0·36	..	..
Other heart or blood vessel conditions, e.g., varicose veins, lower limbs .. .. ..	11	0·01	7	0·08	5	0·02	..	..
	139	0·16	38	0·42	142	0·65	..	..
Lungs—								
Chronic bronchitis, bronchiectasis .. .. ..	37	0·04	27	0·31	10	0·05	2	0·51
Effects of old infection, e.g., thickened pleura, fibrosis of lung, collapse .. .. ..	8	0·01	3	0·03	4	0·02	..	..
Asthma .. .. ..	174	0·21	9	0·10	74	0·34	3	0·76
Tuberculosis .. .. ..	6	0·01	12	0·13	..	..	..	..
Other .. .. ..	11	0·01	8	0·09	14	0·06	2	0·51
	236	0·28	59	0·66	102	0·47	7	1·78
Other conditions								
Undescended testicle .. .. ..	171	0·20	19	0·21	40	0·18	2	0·51
Hernia .. .. ..	85	0·10	20	0·22	58	0·27	4	1·02
Other .. .. ..	114	0·13	16	0·18	109	0·50	3	0·76
	370	0·43	55	0·61	207	0·95	9	2·29

## REPORT OF THE DIRECTOR, DIVISION OF DENTAL HYGIENE

For more than a decade every report presented by this division has made reference to the need for an increased staff of school dental nurses and dental officers to provide regular dental attention for a rapidly growing primary school population. This need still exists, but it is most gratifying to be able to report that the increase recorded last year in the number of pre-school and primary school children brought under the care of school dental clinics has been sustained and that further classes again have been enrolled during the past 12 months.

It is to be emphasised, however, that until a full dental nurse staff is available, recourse must still be made to the emergency system of providing dental care for a section of the older primary school children, that is, through private practitioners under the Social Security (Dental Benefits) Regulations. It is recognised that this arrangement is not very convenient as compared with the established plan of providing dental care within the school precincts, but it has been accepted as an interim measure until such time as the normal ratio of school dental nurses to children has been restored. This, according to the division's long-term staffing plan, should be achieved in the early 1960's.

The final step in this plan was the establishment in 1956 of a third School for Dental Nurses in Christchurch, which in February of this year graduated a full draft of school dental nurses. This draft of 50, together with 47 from the Auckland school and 95 graduates from Wellington, has brought about the more favourable treatment position to which reference has already been made.

The total number of children now under treatment by dental officers and school dental nurses in the School Dental Service is 338,735. This is 17,516 more than in 1957 and an increase of 86,261 since 1954.

The New Zealand School Dental Service continues to receive favourable attention from overseas. During the year the Director was invited to participate in the proceedings of the Twelfth International Dental Congress at Rome and Mr J. Ll. Saunders, the immediate past Director, was appointed a member of the WHO Expert Advisory Panel on Dental Health and shortly leaves for Geneva to take part in discussions on the use of auxiliary dental personnel. Visitors of note were Professor F. C. Wilkinson, Dean, Eastman Dental Hospital, London, and Dr C. L. Sebelius, Dental Health Officer, World Health Organisation, who were both in New Zealand for short periods and during their stay saw various phases of the division's activities. Many requests for information about the New Zealand system of training and employing school dental nurses continue to be received.

## STAFF

On 31 March 1958 the professional and technical staff of the Dental Division numbered 1,304, comprising 59 dental officers, 4 matrons, 5 hostel matrons, 29 dental nurse inspectors and dental tutor sisters, 775 school dental nurses (of whom 64 are part time), 407 student dental nurses, and 25 dental attendants.

Up to the war years the Public Service Regulations required all female officers in the Public Service to retire in the event of marriage. This resulted in an unfortunate loss of trained and, in many cases, highly efficient and experienced school dental nurses. Since the war most trained school dental nurses remain in the Service for varying lengths of time immediately after marriage, while others who have left return when their children are reasonably independent of immediate maternal care. The service given by married nurses is very considerable and at March 1957 nearly 24 per cent of the total school dental nurse staff were married women, of whom 34 had served more than five years after marriage.

Of particular moment, in relation to staff, is the need to ensure that the dental officer staff engaged in administration and teaching is maintained at greater strength. This applies particularly to the Schools for Dental Nurses. The ability to teach is not an inherent attribute of every dentist and a stage in the development of the Service has now been reached where plans should be made to attract and retain able and experienced dental teachers.

## DENTAL PRACTITIONER SERVICE

Free dental care for adolescents up to 16 years of age has been available since 1947 – a period of 11 years. It was originally planned that all treatment for adolescents should be carried out in State clinics staffed by salaried dental officers, and specially equipped clinics were established for this purpose. At the same time, however, by arrangement with the New Zealand Dental Association, it was agreed that private practitioners should assist by rendering treatment for adolescents on a fee-for-service basis under Social Security (Dental Benefits) Regulations as an interim measure until such time as the salaried dental officer service could be fully developed. The salaried service has made little progress because of the difficulty of recruiting dental surgeons. With few exceptions it is staffed by dentists who have held Department of Health bursaries during training and so are required to serve under the Crown (or with an approved hospital board) for a specified period up to three years as part of the agreement under which they held the bursary. On the other hand, the Social Security dental benefits system has proved acceptable to the dental profession and developed rapidly. During the current year as a matter of expediency both the salaried dental officers in State clinics and private practitioners have continued to treat groups of children from the upper classes of certain primary schools, as well as post-primary children up to the age of 16, in order to allow school dental nurses to concentrate on the care of the younger age groups.

**(a) Treatment by Salaried Dental Officers of the Department**

No new State dental clinics designed for dental officers have been established during the year. The following are the statistics for the year under review for clinics controlled by dental officers (figures for the previous year in parentheses) :

*Table 35*

Number of dental officers ..	..	..	..	23	(18)
Number of dental attendants ..	..	..	..	25	(17)
Number of treatment centres (including sub-bases) ..	..	..	..	27	(17)
Number of schools under treatment ..	..	..	..	73	(64)
Number of patients under treatment ..	..	..	..	8,272	(7,148)
Operative dental treatment—					
Total number of fillings ..	..	..	..	40,937	(33,283)
Total number of teeth extracted ..	..	..	..	3,503	(3,799)
Total number of operations ..	..	..	..	66,601	(55,806)

**(b) Treatment by Private Dental Practitioners**

Statistics relating to treatment rendered under the Social Security (Dental Benefits) Regulations for the year under review are as follows (figures for the previous year in parentheses) :

*Table 36*

Number of children enrolled for general dental benefits as at 31 March 1958 ..	..	..	..	169,482	(172,724)
Number of children who ceased to be enrolled for general dental benefits on attaining 16 years of age ..	..	..	..	28,640	(28,256)
Total amount paid private dental practitioners for treatment rendered under dental benefits ..	..	..	..	£922,045	(£906,313)
Number of completed treatments in respect of which the above sum was paid ..	..	..	..	272,020	(278,111)
Average cost per completed treatment for general dental benefits ..	..	..	..	£3 7s. 9d.	(£3 4s. 9d.)

Of the 789 private dental practitioners holding annual practising certificates as at 31 March 1958, 588 had contracted to provide treatment under the dental benefit system. This latter figure does not include dentists who are employed by contracting dentists as assistants and therefore the figure 588 does not represent a total number of dentists engaged in providing dental benefit treatment.

### SCHOOL DENTAL NURSE SERVICE

The following are the statistics relating to the work of the School Dental Nurse Service (including the Schools for Dental Nurses) for the year ended 31 March 1958 (the previous years figures in parentheses) :

*Table 37*

Number of school dental nurses ..	..	..	..	775	(700)
Total number of treatment centres (including sub-bases) ..	..	..	..	808	(766)
Number of schools under treatment ..	..	..	..	2,404	(2,405)
Number of children under regular treatment ..	..	..	..	330,463	(314,071)
Operative dental treatment—					
Total number of fillings ..	..	..	..	1,624,462	(1,571,394)
Number of teeth extracted ..	..	..	..	86,785	(91,254)
Total number of operations ..	..	..	..	2,559,577	(2,420,667)

It is satisfactory to find again that there has been a further increase in the enrolment of pre-school children at school dental clinics. The number of pre-school children now receiving regular treatment is 52,860

and as in the case of the last two years, represents more than one in every three of all children between two and a half to five years of age in New Zealand. This figure compares more than favourably with those recorded in any other part of the world.

### TRAINING SCHOOLS FOR DENTAL NURSES

During the year further progress has been made in providing facilities for the division's full training programme planned to allow an intake of 200 students per year. The extensions to the School for Dental Nurses, Auckland, have now been completed and allow the original intake of 40 students per year to be increased to 50 or even 55 per year.

The School for Dental Nurses, Christchurch, continues to function efficiently under most difficult conditions, training being carried out partly in the hostel building, partly in the St. John Ambulance building and partly in a temporary annexe which has been built in the hostel grounds. The contract for the permanent school was let early in the year and building operations have now commenced. It is expected that the new building will be ready for occupation in May 1959, and until then training must continue on a makeshift basis as at present.

In the 10-year period 1946–56 an average of 11 per cent of those commencing training failed to complete the course. Of the 89 per cent completing the course approximately 86 per cent graduated at the end of two years, 5 per cent between two years one month and two years and six months, and 9 per cent between two years six months and three years.

Now that the required maximum intake of students has become possible the next step is consideration of ways and means of reducing the loss during training. As a result of observations overseas I am confident that a bigger ratio of teachers to students and better teaching aids would materially assist in this direction.

### REFRESHER COURSE

The one course organised in the year under review was held in May 1957 at the Wellington school and was attended by 22 nurses, all of whom had graduated from the Wellington school more than 10 years previously. As has been the experience in other years, the course of instruction and lectures was much appreciated by all nurses attending. Short refresher courses at regular intervals for dental staff engaged in public health work are a prominent feature of overseas dental health services. This, with our own experience, seems to confirm that the proposed plan to recall all dental nurse staff for a short refresher course at the end of each five years field service is sound policy.

### HEALTH EDUCATION

It is recognised as essential that children should be educated to understand and observe the principles of oral hygiene, and to this end school dental nurses keep up as a routine the personal instruction of children in home care of the mouth, lectures and addresses to parents and the preparation of health exhibits and stalls for public functions. The department has in its 775 school dental nurses working in 2404 schools throughout New Zealand a tremendous potential for health education work,

which at the present time, is not being utilised to the full. The immediate need is a senior officer in the Division of Dental Hygiene to organise and direct dental health education throughout New Zealand and I propose that as soon as the Head Office staff of this Division is again at full strength that one senior officer should devote much of his time to this activity. The two Health Education Tutor Sisters, already engaged full time in dental health education work, prepare teaching material and assist and direct field nurses in dental health education activity as far as it is possible to achieve in the limited time at their disposal.

### DIRECTOR'S TOUR OVERSEAS

During the year under review the Director, Dr J. B. Bibby, was absent from New Zealand for eight months on sabbatical leave, the control of the division during his absence being placed in the hands of the Deputy Director, Dr G. H. Leslie. On the first stage of the Director's tour he visited certain of the South-East Asian countries including Malaya, Indonesia, North Borneo, Thailand, Burma, and Ceylon in connection with assistance given to dental services in these countries by the New Zealand Government under the Colombo Plan. Later he attended the Twelfth International Dental Congress held at Rome as the New Zealand Government representative, and also visited Great Britain, Scandinavia, and the United States, to study recent developments in dental science and practice, especially in the field of preventive and public health dentistry, health education, and research.

### COLOMBO PLAN

The division has continued to give assistance where sought in the development of dental services in the countries of the Western Pacific and South-East Asia regions.

The School for Dental Nurses in Ceylon, which was established under the immediate direction of Mr F. B. Rice, was officially opened by the Right Hon. Walter Nash on 21 March 1958. Mr Rice, whose term of duty in connection with the School Dental Service in Ceylon expired at the end of 1957, has been seconded to Ceylon at the request of the Ceylon Government for a further six months, in order to undertake a dental survey and to present a plan for the coordination of all dental services in the island.

During the year Miss The Gwat Lan from Indonesia completed three months' study of the New Zealand Dental Service, and Miss Buddaruckit of Thailand returned to her home country after a two-year course of special duty.

Dental officers from Thailand and Ceylon are at present attached to the Wellington and Auckland schools respectively, and students from Borneo, Sarawak, and Thailand are in training.

### DENTAL BURSARIES

New bursaries were granted to nine dental students during the 12 months ending 31 March 1958. Of the bursaries granted in previous years 38 were renewed, seven were suspended temporarily, and five terminated at the request of the bursary holders. The total number of bursaries held on March 1958, including those temporarily suspended was 59.

### ACKNOWLEDGMENTS

I wish to express my appreciation of the work done during the year by all officers of the Dental Division, but particularly by the professional and clerical staff of my head office who were called upon to meet extra responsibilities and commitments of work during my absence overseas.

I also gratefully acknowledge the work of dental clinic committees throughout New Zealand and the cooperation of all those other organisations and individuals, including other branches of the Department, who in various ways have assisted the work of the division during this year.

J. BRUCE BIBBY,  
Director, Division of Dental Hygiene.

## REPORT OF THE DIRECTOR, DIVISION OF HEALTH EDUCATION AND MATERNAL WELFARE

During the year a new Division of Health Education and Maternal Welfare was established and this numerically replaces in this report the pre-existing Division of Private and Maternity Hospitals. The new Director, Dr C. N. D. Taylor, is at present overseas on a World Health Organisation Fellowship studying all aspects of health education administration in the United States and the United Kingdom. This first report of the division has been prepared by other officers concerned and is submitted on Dr Taylor's behalf.

### HEALTH EDUCATION

Health education as a unit of the Department has progressed considerably during the year. In 1957 the branch was given the status of a division and Dr C. N. D. Taylor was appointed Director. The establishment of health education officers was also increased from nine to sixteen so that every health district now has the benefit of the services of these specialist officers. Two health education officers are stationed at Auckland, Wellington, and Christchurch and one in each of the other health districts.

Health education activities were continued during the year as an integral part of Health Department preventive planning and performance. Much in-service training was again carried out with various groups at the Nurses' Post-Graduate School, the short orientation course for public health nurses, the training course for inspectors of health, and the training school for dental nurses. Eleven new health education officers were also trained in principles and methods of health education of the public prior to posting to various health districts.

Field personnel were active in disseminating the Department's teaching in all aspects of preventive medicine through group instruction. Increasing public awareness in the value of this teaching is evidenced by a continually growing demand for these services.

In addition to the individual efforts of field officers, team work was common to all districts, the main attack being on education in hydatid control. District meetings were convened by the medical officers of health when plans of attack to be implemented by the teams were worked out. The Health Department is working in collaboration with the Department of Agriculture in this project.

District health education committees met regularly throughout the year determining local priorities and needs in health education work. Many displays and exhibits were prepared by district personnel and presented at industrial fairs, agricultural and pastoral shows, and the like. Here again hydatids was the predominant theme, but foodhandling, sanitation, home safety, pasteurised milk, etc., were also featured in many of the districts.

In August the health education officers were assembled in Wellington for a three-day refresher course during which aspects and problems of the work were discussed. A feature of the course was a workshop at which the officers exchanged ideas and experiences. The exchange of ideas again proved stimulating and of mutual benefit.

The head office health education committee has continued the national health advertisements in the main daily newspapers and periodicals, health advice panels were displayed in 400 railway carriages, and a large hoarding outside the Wellington Railway Station carried health messages. Almost  $1\frac{1}{2}$  million pulls of current and past advertisements were supplied as hand-out leaflets; eight new pamphlets were issued and five more put into production, and 22 new titles were added to the film library catalogue, bringing the total up to 477. To augment the intensive anti-hydatid campaign a new flannelgraph was produced, a revised filmstrip and booklet were issued, the number of circulating copies of the sound film *This Dog is Dangerous* was increased to 34, and special hydatid advertisements were featured in country newspapers and farmers' periodicals.

Circulation of the Department's official bulletin *Health* was maintained at 50,000 copies per issue. Four issues were printed during the year. The national weekly radio talks were continued over the YA and ZB networks and numerous requests for cyclostyled copies of the talks were received during the year.

Throughout the Department a wide variety of educational media were used to suggest action to the individual to improve personal, family, and community health.

## MATERNAL WELFARE

### Statistics Relating to Maternal and Infant Care

Statistics relating to birthrates and maternal and infant mortality are given in Table 38, an analysis of the causes of maternal deaths in Table 39, and the statistics relating to confinements in maternity hospitals with the complications encountered are given in Table 40. In Table 39 comparative figures for 1956 are given and in Table 38 figures for the years 1953 to 1957 inclusive are shown.

The maternal mortality rate (excluding septic abortion) for Europeans is 0·54 per 1,000 live births compared with a rate of 0·28 per 1,000 live births for 1956. It will be seen that in general terms the number of deaths attributed to some condition complicating the delivery rose from six to 14 and the number due to some toxæmic cause rose from six to 10. The absolute numbers of the deaths are small and the increase of one death under several headings is sufficient to contribute significantly to the overall rate. An increase of one death is seen under nine headings: an increase of two deaths under three headings: no change in the number of deaths is seen under two headings, and a decrease of one death is seen under two headings. It is notable that as in 1956 only one death was ascribed to sepsis, excluding cases of septic abortion, which was two compared with three in 1956.

The maternal mortality rate (excluding septic abortion) for Maoris is 1·36 per 1,000 live births, compared with 1·30 per 1,000 live births for 1956. Here the absolute numbers under all headings are very small. It is again notable that infection was incriminated in only one case and there was no case of septic abortion recorded.

The infant mortality rate for Europeans is essentially unchanged at 19·98 deaths per 1,000 live births. The Maori rate has risen from 54·36 to 57·90 per 1,000 live births. The combined rate is 24·28, compared with 23·20 deaths per 1,000 live births in 1956.

The stillbirth rates for Europeans and for Maoris show a decrease to give a combined rate of 15·75, compared with 17·06 stillbirths per 1,000 total births in 1956.

The combined neo-natal death rate is 14·67, compared with 14·07 deaths per 1,000 live births in 1956.

The combined stillbirth rate and neo-natal death rate of 30·19 per 1,000 total births is better than the corresponding rate of 30·89 of 1956.

### Epidemiological Investigations Relating to Maternal and Child Welfare

During the year a number of epidemiological investigations were made to gather data dealing with staphylococcal infection in hospitals. In this work acknowledgment is made of the meticulous work of Dr H. T. Knights of the National Health Institute.

A paper is shortly to be submitted by him for publication in the *New Zealand Medical Journal*.

It is early to judge the result of measures taken to prevent infection or to minimise its incidence, but action taken ranges from the use of special soaps and creams and topical antibiotics to rooming-in facilities and the installation of air-conditioning systems.

The failure of a second line of defence in the nature of antibiotics has more than ever showed the vital need of attending to the first principles of a sepsis in techniques associated with childbirth.

I. J. JEFFERY,  
for Director, Division of Health Education and  
Maternal Welfare.

*Table 38—Number of Births per Annum, Birth Rate, Infant Mortality and Maternal Mortality Rates, 1953–57*

		1953	1954	1955	1956	1957
Number of live births per annum..	E.	46,414	48,431	49,869	50,430	51,852
	M.	5,529	5,700	5,807	6,163	6,632
Live birth rate	.. .. E.	24·12	24·63	24·86	24·67	24·82
	M.	44·54	44·37	43·64	44·64	46·29
	C.	25·35	25·84	26·03	25·93	26·20
Infant mortality rate per 1,000 live births	E.	20·06	19·99	20·09	19·39	19·98
	M.	73·07	58·60	62·51	54·36	57·90
	C.	25·70	24·05	24·52	23·20	24·28
Still-birth rate per 1,000 total births	E.	18·75	17·69	15·71	16·73	15·83
	M.	21·59	19·10	16·10	19·72	15·15
	C.	19·05	17·84	15·75	17·06	15·75
Neo-natal death rate per 1,000 live births	E.	14·31	14·33	14·14	13·34	13·89
	M.	26·95	20·00	19·63	19·96	20·81
	C.	15·65	14·93	14·71	14·07	14·67
Still-birth rate and neo-natal death rate combined per 1,000 total births	E.	32·79	32·02	29·62	29·85	29·50
	M.	47·96	38·72	35·41	39·29	35·64
	C.	34·41	32·50	30·23	30·89	30·19
Maternal mortality rate (including septic abortion) per 1,000 live births	E.	0·54	0·52	0·44	0·34	0·58
	M.	1·27	1·58	2·07	1·46	1·36
	C.	0·62	0·63	0·61	0·46	0·67
Maternal mortality rate (excluding septic abortion) per 1,000 live births	E.	0·52	0·43	0·36	0·28	0·54
	M.	1·27	1·23	1·89	1·30	1·36
	C.	0·60	0·52	0·52	0·39	0·63

Table 39—*Maternal Deaths, 1956 and 1957*

Causes of Death	Number of Deaths		Rate Per 1,000 Live Births	
	1956	1957	1956	1957
<b>A. EUROPEAN</b>				
642. Toxaemia of pregnancy—				
642.1. Renal disease arising during pregnancy	..	1	..	0·02
642.2. Pre-eclampsia of pregnancy	..	..	0·02	..
642.3. Eclampsia of pregnancy	..	1	0·04	0·02
642.5. Other	..	3	0·06	0·10
	6	7	0·12	0·14
645. Ectopic pregnancy—				
645.0. Without mention of sepsis	..	1	..	0·02
648. Other complications arising from pregnancy—				
648.3. Other	..	1	..	0·02
650. Abortion without mention of sepsis or toxæmia—				
650.0. Spontaneous or unspecified	..	1	..	0·02
651. Abortion with sepsis—				
651.0. Spontaneous or unspecified	..	1	..	0·02
651.2. Induced for other than medical reasons	3	1	0·06	0·02
	3	2	0·06	0·04
652. Abortion with toxæmia, without mention of sepsis—				
652.1. Induced for medical reasons	..	1	..	0·02
670. Delivery complicated by placenta praevia or antepartum haemorrhage	..	1	3	0·02
671. Delivery complicated by retained placenta	..	1	2	0·02
672. Delivery complicated by other post-partum haemorrhage	..	1	2	0·02
675. Delivery complicated by prolonged labour	..	..	2	0·04
677. Delivery with other trauma	..	3	3	0·06
678. Delivery with other complications of childbirth	..	..	1	0·02
681. Sepsis of childbirth and the puerperium	..	1	1	0·02
682. Puerperal phlebitis and thrombosis	..	1	..	0·02
686. Puerperal toxæmia	..	..	2	..
688. Other and unspecified complications of the puerperium—				
688.2. Sudden death from unknown cause	..	..	1	0·02
Totals, including septic abortion	..	17	30	0·34
Totals, excluding septic abortion	..	14	28	0·28
				0·54

Table 39—*Maternal Deaths 1956 and 1957—continued*

Causes of Death	Number of Deaths		Rate Per 1,000 Live Births	
	1956	1957	1956	1957
<b>B. MAORIS</b>				
642. Toxaemia of pregnancy—				
642.1. Renal disease arising during pregnancy	..	1	..	0·15
643. Placenta praevia .. .. ..	1	..	0·16	..
645. Ectopic pregnancy—				
645.0. Without mention of sepsis .. ..	1	..	0·16	..
650. Abortion without mention of sepsis or toxæmia—				
650.0. Spontaneous or unspecified .. ..	2	1	0·31	0·15
651. Abortion with sepsis—				
651.2. Induced for other than medical reasons	1	..	0·16	..
670. Delivery complicated by placenta praevia or ante-partum haemorrhage .. .. ..	1	1	0·16	0·15
671. Delivery complicated by retained placenta ..	2	1	0·31	0·15
672. Delivery complicated by other post-partum haemorrhage .. .. ..	1	3	0·16	0·46
682. Puerperal phlebitis and thrombosis .. ..	..	1	..	0·15
689. Mastitis and other disorders of lactation ..	..	1	..	0·15
Totals, including septic abortion .. ..	9	9	1·46	1·36
Totals, excluding septic abortion .. ..	8	9	1·30	1·36

*Table 40—Statistics of Maternity Services and Cases, 1957*

—		Private Hospitals	Public Hospitals	St. Helens Hospitals	Alexandra Home, Wellington	Totals
Number of hospitals ..	..	40	153	3	1	197
Number of beds ..	..	381	2,206	133	19	2,739
Admissions for ante-natal treatment ..	..	278	4,132	235	14	4,659
Admissions for delivery ..	..	8,844	44,537	3,151	448	56,980
Confined at full term ..	..	8,250	41,492	2,839	421	53,002
Confined between seventh month and full term ..	..	465	2,437	258	10	3,170
Total confinements ..	..	8,715	43,929	3,097	431	56,172
Abortions ..	..	5	92	..	..	97
Instrumental delivery ..	..	1,034	3,477	181	36	4,728
Inductions—						
Medical ..	..	657	3,216	253	45	4,171
Surgical ..	..	460	2,260	119	18	2,857
Combined ..	..	239	1,179	82	18	1,518
Manual removal of placenta ..	..	98	621	51	1	771
Caesarean section ..	..	114	884	65	6	1,069
Haemorrhage—						
Accidental ..	..	34	453	35	..	522
Unavoidable (placenta praevia) ..	..	25	264	34	2	325
Post-partum ..	..	98	1,845	192	12	2,147
Eclampsia ..	..	4	47	6	1	58
Death of infants—						
Born alive ..	..	41	517	39	1	598
Stillborn ..	..	96	689	44	3	832
Morbidity—						
Not notifiable (mild) ..	..	158	1,304	63	20	1,545
Notifiable (puerperal pyrexia) ..	..	81	1,158	128	14	1,381
Puerperal fever ..	..	2	47	..	..	49
Transferred—						
Before delivery ..	..	103	467	15	12	597
After delivery ..	..	57	854	30	1	942

## REPORT OF THE DIRECTOR, DIVISION OF TUBERCULOSIS

No alteration has been made to the existing programme for the control of tuberculosis. The programme is based on close cooperation between the curative and diagnostic services of hospital boards and the district health offices working in the epidemiological field.

District health offices have been active in case finding with mass miniature radiography. There are now nine units operating throughout the country, during the year a new unit being stationed at Gisborne.

Some 242,332 persons were examined and 380 active cases of tuberculosis found (a rate of 1·56 per 1,000 examinations). Departmental units were therefore responsible for the discovery of 24·8 per cent of all notified pulmonary cases.

The following table shows the results achieved:

*Table 41*

Unit Number	Number Examined	Tuberculosis				Other Lung Conditions	Cardio Vascular Disease
		Healed	Inactive	Active	Active Cases Per 1,000 Examined		
001 ..	33,418	310	178	56	1·67	274	154
002 ..	42,830	322	202	66	1·54	177	38
003 ..	31,269	403	15	42	1·34	15	68
004* ..	..	..	..	..	..	..	..
005 ..	25,437	384	57	26	1·02	300	131
006 ..	22,877	531	14	25	1·09	18	64
007 ..	32,368	33	..	55	1·70	482	85
008 ..	7,695	70	113	16	2·08	98	68
009 ..	25,889	113	74	30	1·16	210	66
010 ..	20,549	82	63	64	3·12	263	60
<b>Totals</b>		<b>242,332</b>	<b>2,248</b>	<b>716</b>	<b>380</b>	<b>1·56</b>	<b>1,837</b>
1957	242,332	2,248	716	380	1·56	1,837	734
1956	202,672	2,391	550	359	1·77	2,352	643
1955	126,377	1,619	335	258	2·04	1,357	750

\*Under control of Otago Hospital Board.

In spite of the extra work load due to the extensive poliomyelitis inoculation campaign, field staff continued with the Mantoux testing of contacts of cases, hospital personnel, and secondary school children. Negative tuberculin reactors were offered B.C.G. vaccination. Results obtained from Mantoux testing over the last few years have indicated that the infection rate is little different in Europeans and Maoris. This finding is rather surprising in view of the higher incidence and mortality experienced by the Maori race. The separate reporting of Mantoux results from the two racial groups has therefore been discontinued in the meantime. (See Table 42.)

Waiting lists for sanatoria and hospital beds throughout the country have disappeared and, indeed, surplus accommodation is available in most institutions. This change has been brought about by modern treatment which has also had the effect of increasing the attendances at outpatient clinics as more cases are dealt with on a domiciliary basis.

Statistical tables are appended and it is to be noted that again there was a slight fall in the number of cases notified to 1,781. The fall, however, has been steady over the last few years and this figure is 292 fewer than the notifications of five years ago. Such decrease as has occurred is evident mainly in the European population, in females rather than males, and in the younger rather than the older age groups.

For the year 1957 the mortality from tuberculosis was slightly higher than for the previous year. For 1957 the overall mortality was 11·2 per 100,000 (European rate 8·7, Maori rate 48·9).

The thanks of the division are due to all those whose work has contributed to the results achieved.

G. O. L. DEMPSTER,  
Director, Division of Tuberculosis.

Table 42—Results of Mantoux Testing

Year	Age Groups (Years)								Total B.C.G. Vaccina- tions							
	0-4		5-9		10-14		15-19		20-24	25-34	35+					
Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive					
1955 ..	..	1,834	66 (3·6%)	2,092	228 (10·8%)	19,962	2,786 (13·9%)	5,568	1,467 (26·4%)	886	308 (34·8%)	1,110	603 (54·3%)	636	471 (73·9%)	26,051
1956 ..	..	2,097	109 (5·2%)	1,933	195 (10·1%)	15,449	1,806 (11·7%)	3,461	677 (19·6%)	949	354 (37·3%)	1,039	562 (54%)	629	399 (63·6%)	20,460
1957 ..	..	2,242	119 (5·3%)	2,303	262 (11·4%)	22,126	2,391 (10·8%)	5,424	1,304 (24%)	1,303	425 (32·5%)	1,121	507 (45·3%)	391	224 (57·4%)	29,287

*Table 43—Morbidity: Notification of New Cases of Tuberculosis During Statistical Year: Incidence of Type of Disease by Race and Sex With Number and Rate Per 10,000 Estimated Mean Population*

Year	Respiratory						Non-respiratory						All Types		
	European			Maori			European			Maori			Both Races		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
1953 .. ..	669 6·9	520 5·4	1,189 6·1	271 42·2	250 40·7	521 41·5	132 1·4	118 1·2	250 1·3	52 8·1	61 9·9	113 9·03	1,124 10·8	949 9·2	2,073 10·02
1954 .. ..	645 6·5	433 4·4	1,078 5·5	280 42·2	293 46·3	573 44·2	84 0·8	90 0·9	174 0·9	49 7·4	35 5·5	84 6·4	1,058 10·0	851 8·1	1,909 9·5
1955 .. ..	660 6·7	479 4·9	1,139 5·8	234 35·8	267 41·7	501 38·8	87 0·87	102 1·0	189 0·96	42 6·4	46 7·2	88 6·8	1,023 9·8	894 8·5	1,917 9·1
1956 .. ..	647 6·3	392 3·9	1,039 5·1	245 39·6	283 42·0	528 38·2	65 0·63	84 0·83	149 0·73	42 6·0	48 7·1	90 6·5	999 9·1	807 7·4	1,806 8·4
1957 .. ..	608 5·8	402 3·9	1,010 4·7	265 36·3	257 36·7	522 36·4	65 0·62	71 0·68	136 0·65	54 7·4	59 8·4	113 7·9	992 8·7	787 7·1	1,781 8·0

*Table 44—Morbidity: Cases of Tuberculosis on Tuberculosis Register at End of Statistical Year: Prevalence of Type of Disease, by Race, With Number and Rate Per 10,000 Estimated Mean Population*

Year	Respiratory						Non-respiratory					
	European		Maori		Both Races		European		Maori		Both Races	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1953 .. ..	7,395	38·1	2,831	225	10,226	49·4	1,007	5·2	535	42·6	1,542	7·3
1954 .. ..	7,476	37·8	3,075	237	10,551	50·1	901	4·5	586	45·2	1,487	7·1
1955 .. ..	7,802	39·8	3,523	273	11,325	54·1	763	3·9	340	26·3	1,103	5·3
1956 .. ..	8,146	39·8	3,749	270	11,895	55·0	711	3·5	402	29·1	1,113	5·1
1957 .. ..	8,395	40·0	4,055	283	12,450	55·8	615	2·9	448	31·3	1,063	4·8

Table 45—*Cases of Tuberculosis on Tuberculosis Register at End of Statistical Year: Prevalence of Bacteriological and Clinical States*

Year	Bacteriological State					Cases on Register	
	Sputum or Discharge		No Sputum or Discharge Available	Not Investigated			
	T.B.+	T.B.-					
1953 .. .. ..	1,117	4,338	4,576	1,737		11,768	
1954 .. .. ..	998	4,989	4,757	1,294		12,038	
1955 .. .. ..	841	5,524	4,809	1,254		12,428	
1956 .. .. ..	691	5,829	5,005	1,483		13,008	
1957 .. .. ..	583	5,707	5,580	1,643		13,513	

Year	Clinical State					Removed from Register as Recovered During Year	
	Active		Quiescent and Arrested	Unknown or Believed Well			
	Deteriorating and Stationary	Improving		Unknown	Believed Well		
1953 .. .. ..	1,220	2,446	6,990	631	481	901	
1954 .. .. ..	1,111	2,534	7,370	630	393	1,147	
1955 .. .. ..	1,036	2,388	8,134	651	219	1,043	
1956 .. .. ..	770	2,496	8,501	758	483	693	
1957 .. .. ..	771	2,361	8,963	936	482	860	

Table 46—Mortality—Deaths from Tuberculosis During Statistical Year, Mortality by Type of Disease, by Race and Sex,  
With Number and Rate Per 100,000 Estimated Mean Population

Year	Respiratory												Non-respiratory												All Types											
	European						Maori						Both Races						European						Maori						Both Races					
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.			
1953— Number ..	114	61	175	46	36	82	160	97	257	33	21	54	39	93	147	82	229	67	54	121	214	136	214	136	350	13.7	13.7	17.6	13.7	13.7	17.6					
Rate ..	12.1	6.5	9.3	74.7	61.4	68.2	15.9	9.8	12.9	3.5	2.2	2.9	34.1	30.7	32.4	5.4	3.9	4.7	15.6	8.8	12.2	108.7	92.1	100.7	21.3	21.3	21.3	100	100	100	9.6	9.6	14.4			
1954— Number ..	137	44	181	34	37	71	171	81	252	16	6	22	16	13	29	32	19	51	153	50	203	50	100	203	100	303	100	100	100	9.6	9.6	14.4				
Rate ..	13.9	4.5	9.2	51.8	59.0	55.3	16.2	7.8	12.0	1.6	0.6	1.1	24.3	20.7	22.5	3.0	1.8	2.4	15.5	5.1	10.3	76.1	79.7	77.8	19.2	19.2	19.2	100	100	100	9.6	9.6	14.4			
1955— Number ..	136	59	195	35	26	61	171	85	256	10	13	23	11	3	14	21	16	37	146	72	218	46	29	75	29	75	192	192	192	10.1	10.1	13.7				
Rate ..	13.5	5.9	9.7	51.4	40.0	45.8	15.9	8.0	12.0	1.0	1.3	1.1	16.1	4.6	10.5	2.0	1.5	1.7	14.5	7.2	10.9	67.5	44.6	56.4	56.4	56.4	56.4	17.8	17.8	17.8	9.5	9.5	13.7			
1956— Number ..	96	46	142	30	32	62	126	78	204	13	6	19	5	11	16	18	17	35	109	52	161	35	43	78	43	78	144	144	144	9.5	9.5	23.9				
Rate ..	9.3	4.5	6.9	42.5	47.4	44.9	11.5	7.2	9.3	1.3	0.6	0.9	7.1	16.3	11.6	1.6	1.6	1.6	10.6	5.1	7.8	49.6	63.7	56.4	56.4	56.4	56.4	13.1	13.1	13.1	8.8	8.8	10.9			
1957— Number ..	113	46	159	35	28	63	148	74	222	12	10	22	7	0	7	19	10	29	125	56	181	42	28	70	28	70	167	167	167	84	84	251				
Rate ..	10.8	4.4	7.6	47.9	39.9	44.0	13.2	6.7	9.9	1.1	1.0	1.1	9.6	0.0	4.9	1.7	0.9	1.3	11.9	5.4	8.7	57.4	39.9	48.9	48.9	48.9	48.9	7.6	7.6	7.6	11.2	11.2	11.2			

## REPORT OF DIRECTOR, DIVISION OF CLINICAL SERVICES

A good deal of attention has been directed this year to the promotion of closer cooperation between the Department and medical practice. This policy is based on the belief that without mutual understanding and respect no worth-while progress can be made.

During the year I was privileged to address special meetings of the 12 largest divisions of the British Medical Association on the aims and policy of the Department in relation to the medical scheme. These meetings were well attended, and they obviously helped to clear up many misconceptions about the attitude of the Department. When visiting the various centres I also took the opportunity of calling on as many doctors as possible in their own surgeries to gain impressions of general practice, exchange information and ideas, and invite criticism of the administration of the scheme.

An important step in the same direction was the appointment of Dr T. L. Hayes as Assistant Director. He was selected partly on account of his former training in pharmacy and, equally important, because of his recent experience in general practice. He has already shown how great a contribution can be made by an appointment of this kind, not only to the efficient running of the division, but in fostering good will between the Department and the medical and pharmaceutical professions.

Finally, there are the Prescriber's Notes, which are now issued regularly to all medical practitioners and senior medical students. These are of three kinds: Clinical Services Letters, Notes on Prescribing Costs, and Therapeutic Notes. Fourteen were issued this year. They provide a useful medium for passing on information to prescribers, particularly about new and expensive remedies, emphasis being laid on comparative costs. They go some little way towards countering the sales propaganda so vigorously pursued by the drug manufacturers. In addition, information of a detailed and personal nature is now being issued to individual doctors about their own prescribing patterns, based on studies of batches of their prescriptions. Shortage of qualified staff has hampered this development, but it is now progressing fairly satisfactorily.

### "Difficult Doctors"

It is often said that doctors in the mass are difficult people to deal with. Experience in the past year has shown, however, that the profession in New Zealand responds well to a reasonable approach. This year's improvement in prescribing statistics (described below) is striking evidence of this. So long as the average doctor feels that the administration of the scheme is in the hands of members of his own profession who understand and respect his point of view and are zealous, as he is, for the profession's standing and good name, he will be more than willing to cooperate.

In my contacts with practitioners this year, whether singly or in groups, I have met with nothing but good will, reasonable criticism where such has been offered, and every evidence of a general desire

to further the interest of good medicine. The shortcomings of the service, and of individual practitioners here and there, readily find publicity, and it is all too easy to make the doctor the scapegoat for the rising cost of the medical scheme. But the truth is that taking it all over, the standard of general practice in this country is exceedingly high; the more I see of it, the more impressive I find it.

### Pharmaceutical Benefits

The total cost of pharmaceutical benefits in 1957-58 was £106,016 lower than the previous year's total, and more than £500,000 below this year's estimate. Apart from 1953-54 (when the restriction of ordinary prescriptions to a 15 days' supply was introduced) this is the only occasion when expenditure on this item has dropped below that of the previous year.

By way of contrast, a year ago we had to record an increase of over £500,000, the previous year of almost £1,000,000.

From 1 June 1957, on the advice of the Special Committee on Pharmaceutical Benefits, ordinary prescriptions were restricted to a quantity not exceeding 10 days' supply, instead of 15 as hitherto. At the same time the extended supply provisions were relaxed, permitting the issue of specially endorsed prescriptions for any period of from one to three months (previously two to three months only).

The precise effects of these changes are hard to estimate. They resulted in an immediate, though temporary, drop in the average cost of prescriptions. Rates of prescribing are even more important, however, than average cost, and there is a tendency to an inverse relationship between the two. It is interesting to note, therefore, that the actual recessions in quarterly payments which occurred this year were not closely related to the fall in the average cost of prescriptions which followed on the quantity restrictions imposed on 1 June. Considering drugs, etc., supplied by chemists only:

Quarter	Average Cost per Prescription (Shillings)		Quarterly Payments 1957-58 Compared With 1956-57	
	1956-57	1957-58	£	
April to June ..	..	7.18	7.43	-146,595
July to September ..	..	7.18	7.10*	+ 33,240
October to December ..	..	7.31	7.25	+ 78,525
January to March ..	..	7.49	7.53	- 88,024
Whole year ..	..	7.28	7.32	-121,854

\* Following quantity restriction, commenced 1 June.

This year's improvement as a whole has been the combined result of a halt in the rising average cost of prescriptions, and a drop in the total number issued. There were 12,203,567 prescriptions passed for payment this year, as compared with 12,561,970 last year. The fact that there has been no corresponding drop in the number of visits to or by doctors suggests that this fall has not been due to a lessened amount of illness compared with the previous year. As the population has, of course, increased, this is very encouraging, especially as we have continued to

widen the Drug Tariff by adding a considerable number of new and expensive drugs to the free list. My impression is that an increasing awareness on the part of doctors of the importance of pharmaceutical costs, and their growing interest in this aspect of their work, have been responsible in large measure for the improvement noted.

### Prescribing Patterns

Patterns of prescribing, in regard to frequency and average cost per prescription, vary enormously between different doctors, and from place to place. This can be seen if we compare the figures from the four Pricing Office Areas\* into which the Dominion is divided:

Pricing Office Area	Prescriptions per Head of Population	Average Cost per Prescription	Cost per Head of Population
Auckland .. ..	6·0	s. d. 7 8	£ s. d. 2 6 0
Dunedin .. ..	5·9	7 2	2 2 3
Wellington .. ..	4·8	7 2½	1 14 7
Christchurch .. ..	5·0	6 9¾	1 14 1
Dominion .. ..	5·5	7 3¾	2 0 0

Let us now see what would have been the effect on the total cost last year if all doctors had been prescribing on the patterns of the different areas:

\*Include the following health districts (1958):

Auckland	Wellington	Christchurch	Dunedin
Whangarei	Gisborne	Nelson	Dunedin
Auckland	New Plymouth	Greymouth	Invercargill
Hamilton	Palmerston North	Christchurch	
Rotorua	Wellington	Timaru	

Figures in the table have been corrected to allow for arrears of payment at the beginning and end of the year, and therefore represent prescriptions actually issued during the current year in each area.

Applying the Prescribing Patterns of	Dominion Totals Would Have Been (Millions)		Increase or Decrease on Actual Cost
	Prescriptions	Cost	
Auckland .. ..	13·40	£ 5·14	+15·2
Dunedin .. ..	13·17	4·72	+ 5·8
Wellington .. ..	10·72	3·86	-13·4
Christchurch .. ..	11·16	3·80	-14·8
Actual figures .. ..	12·20	4·46	..

The "Auckland pattern", applied throughout, would have cost an extra £680,000-odd. The "Christchurch pattern" could have saved the country about £660,000.

These variations become even more impressive if we examine the rates of prescribing of the broad-spectrum antibiotics. These form one of the most expensive classes of drugs in common use, prescriptions averaging in cost about £2 4s. each. Here are the figures for the past three years:

*Broad-Spectrum Antibiotics (Fourth Schedule): Prescriptions per 1,000 Population in the Four Pricing Office Areas*

Year Ending 31 March—	Auckland	Wellington	Christchurch	Dunedin	Dominion
1956 .. .. ..	123	60	64	49	82
1957 .. .. ..	143	75	50	51	93
1958 .. .. ..	134	80	48	72	94

Taking this three-year period as a whole, the rate for Auckland was 118 per cent above that for the rest of the Dominion, and 147 per cent above Christchurch.

"Good doctoring" does not imply expensive prescribing, but rather the reverse. The Dominion average prescription cost last year was 7s.  $3\frac{3}{4}$ d. In a list which was drawn up for me of 20 experienced and highly respected practitioners in one centre, there were 10 whose average prescription cost, as a group, was 5s. (The average for all twenty was 5s. 10d.) A general average of 5s. a prescription would not, therefore, be incompatible with good medicine. This figure, and a prescribing rate of 4·5 per head of population (about the average for the past 10 years), would have resulted in a total cost last year of about £2,500,000, in other words, in a saving of about £2,000,000. But such could only happen in a perfect world.

### And the Future?

It would be foolish to suggest, because there has been a break in the rising costs of pharmaceutical benefits this year, that they can be pegged at their present level. This could only be done at the expense of progress in methods of treatment, and that is something this country simply cannot afford.

New Zealand gets good value for its expenditure on drugs. There can be no doubt whatever that the savings achieved in recent years, in lives and human suffering, in economic losses through illness and injury, have been worth far more, even in terms of cash, than has ever been spent on prescriptions. Wasteful and careless prescribing must be checked; but even if everything of that nature is taken into account, we have still been getting value for our money.

New and potent remedies will continue to be produced as time goes on. They will be costly; but we cannot afford to do without them. While pursuing a vigorous campaign for careful prescribing, therefore, we must continue our policy of making the best of the new drugs available at the cost of the Fund as soon as their worth has been established. There can be no standing still, no holding fast to the present position. Any such plan would be shortsighted in the extreme.

I do not believe that, by and large, New Zealand's figures for medical attention are excessively high. Visits to (or by) doctors last year averaged 4·3 per head of population. Great Britain's figure is 5; and

in the United States, where medical charges, with no social security medical scheme, are notoriously high, the latest figure for private practitioner visits is 3·7\*. Similarly, our last year's figure of 5·5 prescriptions a head (representing about three separate prescription forms) is nothing out of the way. Good doctoring could probably reduce the figures, both for services and for prescriptions per head, to about 4. With a fully available medical service I should not expect them to fall much lower.

Tables 47 and 48 give details of the year's expenditure on the various health benefits. The total cost was only £285,595 above the previous year's total, which may be compared with increases of £1,225,558 and £2,958,230 in the two preceding years. It was £748,093 below this year's estimates.

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\**Health Statistics from the U.S. National Health Survey*, February 1958.

Table 48 includes a column showing the average payments to doctors for general medical services. The Dominion average is only £2,114. If 40 per cent be added for additional charges to patients, and £1,250 deducted for practice expenses, the average net income is reduced to £1,710 per annum.\*

I desire once more to commend the excellent work done by the staff of this division during the year. They are a first-class team, and it has been a pleasure to work with them. My thanks are due also to the medical officers of health and their staffs, and the members of the various advisory committees who have given so much willing assistance during the year.

A. W. S. THOMPSON,  
Director, Division of Clinical Services.

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\*This is probably a generous estimate. Detailed studies in 1953 indicated that additional charges to patients in city general practice averaged only 27 per cent of G.M.S. payments, while practice expenses exceeded £1,500 per annum—(*N.Z. Med. Journ.*, June 1953, p. 200).

Table 47—Social Security Fund Medical Benefits: Statement Showing Expenditure Since 1 April 1948

### *Subdivision II—Medical Benefits*

### *Subdivision III—Hospital Benefits*

Treatment in public hospitals ..	..	1,560,483	1,566,824	1,557,830	1,562,716	1,566,320	1,598,947	2,638,191	3,662,651	3,564,457	3,595,714
Out patient treatment ..	..	141,530	147,505	164,508	152,930	163,719	175,338	187,406	341,875	397,716	414,234
Treatment in private hospitals ..	..	245,000	249,085	246,199	269,142	261,878	241,918	375,069	579,542	601,126	616,964
Treatment in approved institutions ..	..	50,362	48,235	43,477	49,264	50,240	56,107	76,432	95,453	107,057	111,789
Private hospital loans ..	..	..	..	..	..	..	..	30,282	68,151	179,368	180,210
Private hospital subsidies ..	..	..	..	..	..	..	..	84,547	3,028	..	..
Grant to Royal N.Z. Society for Health of Women and Children towards operating costs Karitane hospitals ..	..	..	..	..	..	10,000	13,335	14,791	19,113	13,966	19,729
		1,997,375	2,011,649	2,018,963	2,112,494	2,135,218	2,184,239	3,411,040	4,764,666	4,869,453	4,930,424

Table 47—Social Security Fund Medical Benefits, etc.—continued

	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58
<i>Subdivision IV—Pharmaceutical Benefits</i>										
Drugs supplied by—										
Chemists ..	..	..	£1,991,350	2,036,990	2,371,769	2,952,773	2,847,919	2,952,269	3,949,164	4,475,606
Medical practitioners ..	..	..	11,266	6,803	8,287	9,143	10,267	15,951	17,934	22,463
Institutions ..	..	..	41,227	53,207	48,160	53,917	61,434	74,030	79,017	90,326
	1,793,159	2,043,843	2,097,000	2,428,216	3,015,833	2,919,620	3,047,331	4,039,145	4,572,557	4,466,541
<i>Subdivision V—Supplementary Benefits</i>										
Radiological services ..	..	..	249,461	276,999	294,883	310,189	350,120	379,641	409,381	448,374
Laboratory services ..	..	..	117,173	118,447	128,546	149,917	178,892	189,070	227,914	277,458
Physiotherapy services ..	..	..	57,088	63,840	67,388	62,572	62,249	62,575	64,347	64,863
Specialist services (neuro surgery) ..	..	..	4,072	6,553	4,089	3,019	4,654	2,794	2,719	66,499
District nursing services ..	..	..	111,289	116,007	113,571	124,250	114,931	127,016	137,339	150,117
Dental services ..	..	..	223,186	324,933	385,612	469,989	545,002	659,570	716,251	798,756
Domestic assistance ..	..	..	3,258	3,082	3,520	4,699	5,943	7,015	6,071	7,744
Grants to public servants and dependants in respect of medical, hospital, etc., expenses while stationed overseas ..	..	..	..	..	..	..	..	..	..	..
Ambulance benefits ..	..	..	..	..	..	..	..	..	..	..
Artificial aids benefits (commenced 1 July 1947), (artificial limbs, hearing aids, contact lenses) ..	..	..	324	303	324	322	46,981	61,721	63,000	63,646
Payments under section 26, Social Security Amendment Act 1943 ..	..	..	96,062	99,777	62,534	..	190	1,310	3,090	1,359
Grants to intellectually handicapped children's parents' associations ..	..	..	..	..	..	..	..	..	251	581
	861,913	1,009,941	1,060,938	1,181,953	1,310,922	1,492,822	1,633,066	1,818,699	2,118,873	2,284,091
Grand totals ..	..	..	8,461,109	8,723,383	9,368,027	10,428,597	10,607,046	12,588,924	15,547,154	16,772,712
Recoveries ..	..	..	35,411	31,190	4,250	4,033	5,285	4,489	5,566	10,053
Net totals ..	..	..	7,843,634	8,425,698	8,692,193	9,363,777	10,424,564	12,584,435	15,541,588	16,762,659

Table 48—Cost Per Head in Health Districts, General Medical Services and Capitation 1957-58

Health District	Population as at 1 April 1957	Number of Doctors	Average Population per Doctor	Method of Claiming		Total Cost of General Medical Services and Capitation, Including Milage	Average Amount Claimed per Doctor	Total Cost of General Medical Services and Capitation, Excluding Milage	Cost per Head of Population
				Direct	Indirect				
Whangarei	84,858	53	1,601	100	126,155	£2,380	147,129	£1,14	8
Auckland	501,997	503	998	80	1,082,049	2,151	1,120,904	2	4
Hamilton	240,352	135	1,780	95	329,949	2,444	367,634	1	10
Gisborne	169,412	114	1,486	69	247,736	2,173	261,052	1	10
New Plymouth	91,955	57	1,613	100	141,316	2,479	150,386	1	12
Palmerston North	173,648	109	1,593	68	221,696	2,034	233,627	1	11
Wellington	269,887	225	1,199	48	379,268	1,686	388,307	1	8
Nelson	69,856	53	1,318	51	111,287	2,100	123,239	1	15
Christchurch	288,491	235	1,227	75	475,723	2,024	505,000	1	15
Timaru	93,135	61	1,526	84	140,985	2,311	154,618	1	13
Dunedin	146,733	118	1,243	76	281,367	2,384	299,722	2	10
Invercargill	90,845	60	1,514	52	105,468	1,758	118,225	1	6
Totals	..	2,221,169	1,723	1,289	74	26	3,642,999	2,114	10
								3,869,843	

## REPORT OF DIRECTOR, DIVISION OF PHYSICAL MEDICINE

### RHEUMATIC DISEASES

No major changes have occurred in the work of this Division in respect of rheumatic diseases.

Experience at the Queen Elizabeth Hospital during the year shows that oral steroids are being widely used, but are not so much abused as formerly. How much real benefit they are capable of producing over a period is still open to question. Chloroquine is rapidly becoming the most fashionable drug, but it is too early to give a considered opinion on its clinical effectiveness. At least there have so far been no reports of any harm eventuating from its use, and it has the merit of being considerably cheaper than previous anti-rheumatic pharmaceuticals. It would seem that as far as rheumatoid arthritis is concerned the disease pursues an unalterable course, temporarily modified by certain potent steroids, but with no specific remedy. Rational treatment therefore is directed to prevent deformities, encourage muscle and joint activity after any acute process has subsided, and prevent pain by adequate rest, analgesics, and heat. For those with chronic disability much can be done by teaching them methods of overcoming the effects of their disabilities by adapting their clothing, their household equipment, and furniture to suit their needs. By so doing sufferers from rheumatic diseases learn to live with their disabilities and the emphasis is on what they can do rather than on what is no longer possible to them.

The use of hydrocortisone injections into painful joints has, however, been justified. By its use mobility has been restored to painful and stiff joints more safely, surely, and cheaply than is the case with oral steroids.

Further study is required to improve diagnosis. The border line between rheumatoid arthritis and osteo-arthritis is becoming less well defined, and the diagnosis of underlying causes responsible for "fibrositis", "neuritis", and mere "rheumatism" leaves much room for improvement.

The incidence of rheumatic fever in New Zealand is difficult to estimate with any accuracy as the disease is not notifiable, but it appears to be more common than in the United Kingdom. Reference to statistics of hospital records shows that the number is not insignificant and it has to be realised that hospitals do not admit all cases of rheumatic fever. What is significant, however, is that the deaths from rheumatic heart disease (a usual development from repeated attacks of rheumatic fever) have not declined during the last five years as have other diseases. The

following extract from Table 54 on page 119 elsewhere in the Department's report illustrates this:

*Table 49*

Causes of Death	Number of Deaths					Death Rates per 1,000,000 Mean Population				
	1953	1954	1955	1956	1957	1953	1954	1955	1956	1957
Tuberculosis, all forms..	357	304	293	239	254	174	145	137	110	114
Rheumatic fever and chronic rheumatic heart disease ..	294	255	252	239	274	143	122	118	109	123

In 1953 there were 63 (in 1952, 143) more deaths from tuberculosis than from rheumatic fever and chronic rheumatic heart disease, whereas in 1957 there were 20 less. In 1952 the death rate from tuberculosis was 50 per cent higher than that for rheumatic fever and rheumatic heart disease. In 1957 it was 7 per cent less.

The development of heart disease occurs more frequently in people suffering from recurrent attacks of rheumatic fever than it does after a single attack. Modern methods of prophylaxis can prevent the recurrence of an attack in a susceptible person. It is therefore essential that the first attacks are diagnosed by careful routine examination of all children and that the patients are subsequently kept under medical supervision and prophylactic treatment given for some years if similar improvements are to be obtained in the statistics of rheumatic fever as has been the case in tuberculosis.

It is proposed very shortly to institute facilities at the Queen Elizabeth Hospital, Rotorua, for the investigation and diagnosis of doubtful cases of rheumatic fever and chorea in children. So many of these cases remain undiagnosed and therefore escape the precautionary measures which can be taken to prevent a recurrent attack.

In spite of the serious shortage of staff the Queen Elizabeth Hospital cooperated with the School of Social Science of Victoria University in a rheumatism survey of the borough of Rotorua. The work would have been completed by now had more staff been available, but it is hoped to complete it during 1958. The survey is designed to provide controls so that certain social factors in the control group can be compared with those of the Queen Elizabeth Hospital inpatients.

The New Zealand Rheumatism Association Conference was held at the Queen Elizabeth Hospital in October. Originally a combined conference and post-graduate course was planned, but the latter had to be abandoned because of inadequate medical staff.

### CEREBRAL PALSY

It has not been possible to extend appreciably existing facilities for cerebral palsy work. The unit at Rotorua has been seriously hampered by lack of staff and, in order to give an effective service, admissions have been restricted. The policy of giving priority to children under the age of five has been continued.

The visiting physiotherapy service was extended for a short time during the year by the appointment of Miss B. Fisher in the Palmerston North district, but she resigned on marriage early in 1958. Unfortunately it has not been possible to find suitable therapists to cover the needs in other areas of the country, in spite of every effort to secure suitable staff. While overseas, however, during the year I received tentative applications for one of these posts from several suitable people who had heard of New Zealand's scheme, an account of which was given by me at the Annual Congress of the International Society for the Welfare of Cripples in London in July 1957, and it is hoped that it may be possible to secure their services later. There is no doubt whatever that this is the best method of tackling the problem of cerebral palsy as it institutes treatment at the optimum time, i.e., as soon as the condition is diagnosed. It takes advantage of the mother's natural instinct to devote special time and effort to the most ailing member of the family – and it effectively meets all criticism regarding the possible bad psychological effects on the child of separating it from its mother and its home. Finally, to come down to real "earth", it is much the least costly method.

Results achieved in the South Island, where the scheme has been operating for some years, are extremely satisfactory.

There will, however, always be room for cerebral palsy schools, but these should be restricted to catering—

- (a) For those children with normal intelligence who are so severely physically handicapped that special methods of education and management are essential:
- (b) For those children whose homes are unsatisfactory.

It is a mistake for children with an intellectual handicap to be admitted to these schools, even if they have severe cerebral palsy. Not only do they take up an undue proportion of the time of the staff, but their mere presence tends to diminish the status of the schools in the eyes of the parents. If mentally defective cerebral palsy children are admitted they should be gathered in a special class, as would be the case with backward children in an ordinary school.

Although the causes of cerebral palsy are becoming more evident as the result of research, and although measures such as exchange transfusion have been introduced to prevent it, it is unlikely that the number will drop. So many premature babies, who in days gone by would have died, are now enabled to survive through advances in treatment and management, but with some form of brain damage. It is essential, therefore, that plans for the early diagnosis and treatment of these children should be persevered with.

### PHYSIOTHERAPY

A major anxiety during the year was occasioned by a falling off in the teaching staff of the New Zealand School of Physiotherapy in Dunedin. It was thought that it would be necessary to curtail the number of students. In spite of this, however, by taking larger classes the school managed to carry on and 63 students were accepted for the class starting in 1958. There are 42 students in their second year and 42 in the third year. The need for qualified teachers of physiotherapy is very great and considerable difficulty is being experienced in obtaining them.

The bursary scheme continues to operate satisfactorily, 54 being awarded in 1957, in addition to 68 being renewed. There are now 55 qualified bursary physiotherapists under contract to work in hospitals for a period of two years following qualification.

The staffing position in hospitals is still unsatisfactory, there being an average shortage during the year of 44, i.e., approximately 20 per cent. Towards the end of the year the position improved largely as a result of the arrival in this country of overseas-trained physiotherapists.

During the year 20 hospitals, including the four physiotherapy subsidiary schools, were visited by the Inspecting Physiotherapist.

### OCCUPATIONAL THERAPY

There are at present 68 students in training and 79 New Zealand-trained occupational therapists are working in hospitals and institutions in this country. During the year 28 students became registered as occupational therapists. With the wider demand for occupational therapy for rehabilitation schemes and sheltered workshops, and its increasing use in hospitals and geriatric centres, these numbers are quite inadequate to fill the needs. The course of training will be increased to three years commencing July 1958 to bring it into line with training overseas and this will make the shortage more apparent.

Owing to staff shortage it has not been possible for the principal of the school to carry out any inspection of occupational therapy in hospitals.

### QUEEN ELIZABETH HOSPITAL

The matron was able to start a nursing-aid training scheme during the year. This should provide some incentive to girls wishing to acquire nursing recognition and experience without having to undergo the full training course.

Arrangements with the Rotorua Borough Council for the acquisition by the Crown of the land on which the hospital stands are still not finalised. A great deal of maintenance work has been accomplished during the year and the Occupational Therapy Department has been extended.

The number of patients admitted for the year ended 31 December 1957 was 654 as compared with 509 for the nine months ended 31 December 1956. Owing to shortage of staff it was not possible to keep the hospital full, nor was it possible to carry out the post-graduate course for doctors, nor the education programme for the public as had been planned. Much, however, was done by articles written by the medical staff in professional and lay journals.

#### Staff

The Medical Superintendent, Dr W. S. Wallis, retired in May and was replaced by Dr B. S. Rose, the Senior Physician. Unfortunately Dr Wallis died suddenly in September 1957. I would like to take this occasion to record my appreciation of Dr Wallis's great services in helping to establish the Queen Elizabeth Hospital as a rheumatism centre. Dr Blair who carried out the work at the Bathhouse in addition to his consultative capacity at the Queen Elizabeth Hospital retired early in 1957. He had been associated with the Bathhouse since November 1938 and his wide experience and clinical sense made him a worthy

recipient of the O.B.E. with which he was rewarded on his retirement. Reorganisation of the medical work at Queen Elizabeth Hospital was designed to provide for supervision of hydrotherapy activities by a physician of the hospital, thus linking more closely the work of the two institutions, and for additional junior medical officers to be appointed. Unfortunately no applications were received to repeated advertisements until the end of the year. This imposed a great strain on Dr Rose and Dr Isdale, and also on Dr Ridings who gave part-time assistance.

### Bathhouse

The reorganisation referred to in the above paragraph led to a rumour that the Bathhouse was to be closed down. An inter-departmental committee was appointed to consider the whole question of the continued use of the Bathhouse or the provision of suitable alternatives. The committee has made interim recommendations to the Minister. Meanwhile the work has continued, but owing to the complete deterioration of the pipe line from the Priest Spring, Priest water has not been available at the Bathhouse for some months.

### GENERAL MATTERS

An event of interest which took place during the year was the reopening by the Hon. J. R. Hanan, then Minister of Health, of the Pukeora Sanatorium as a home for chronic physically disabled young people. The home is designed to afford care and maintenance to those young people so physically disabled that they are unable to fend for themselves and whose parents are unable to look after them on account of age, infirmity, or other reasons. The home is under the management of the Waipawa Hospital Board and has accommodation for 41 residents. As these patients' only alternative would be the chronic wards of public hospitals it is felt that the scheme should provide a satisfactory solution to what has hitherto been an unsatisfactory position. The indications for admission at present are that applicants should be between the ages of 16 and 30, that they should be so severely physically disabled that they cannot manage to look after themselves independently of outside help, and that they should have no serious intellectual disability. At the time of making this report the home is full on the male side, but there are some vacancies for females.

In conclusion, I would like to acknowledge the help Dr Turbott gave in looking after the work of the division during my absence overseas. It is also a great pleasure to place on record my appreciation of the work of the staff of the Queen Elizabeth Hospital, my colleagues and Section Clerk at head office, and to the Crippled Children's Society.

G. A. Q. LENNANE,  
Director, Division of Physical Medicine.

## REPORT OF THE DIRECTOR, NATIONAL HEALTH INSTITUTE

This report covers the work of the National Health Institute and the Medical Statistics Branch for the year ended 31 December 1957.

### NATIONAL HEALTH INSTITUTE LABORATORIES

#### Buildings

A contract for the construction of a breeding-animal house as an extension to the existing vaccine station was let in May 1957 and the work should be completed in the first half of 1958.

Minor alterations to the teaching laboratory were carried out in July and August and this has allowed the number that can be accommodated to be increased from 10 to 15.

#### Administration

Since August 1955 the examinations for the Certificate of Proficiency in Hospital Laboratory Practice have been held at the National Health Institute. In May 1957 responsibility for the administrative arrangements for the examination was transferred to the institute. Also, the administrative and clerical work in connection with the health inspectors' training course is being gradually taken over. The expansion in teaching activity and rapid increase in laboratory work combined with these new duties have resulted in a considerable increase in clerical work which has kept the augmented staff fully occupied.

#### Educational

(i) *Health Inspectors' Training Course*—There were 13 trainees in the 1957 course. Six were sponsored by the Department of Health, three by local authorities, and four were Colombo Plan trainees. The Tutor Inspector of Health is responsible for the arrangement of lectures, a considerable part of the teaching and supervision of the work and progress of the trainees. Thirty lectures were given by other members of the institute staff.

(ii) *Refresher Course for Senior Inspectors*—Organised in conjunction with the Division of Public Hygiene, a successful refresher course for senior inspectors of health, both departmental and local body, was conducted by the college authorities at Massey College.

(iii) *Training of Bacteriologists*—During nine months of the year weekly lectures were given to the assistant bacteriologists receiving their in-service training.

Six lectures have been given at the Post-graduate School of Nursing. Dr H. T. Knights has given a number of lectures to special groups such as the Registered Nurses Association and the staff of maternity hospitals on the problem of Staphylococcal cross-infection.

Four examinations, two final and two intermediate, for hospital bacteriologists were held at the Institute.

### Laboratories

The number of specimens received for examination has again shown a sharp increase. At 8,677 the number is 54 per cent above the 5,643 specimens last year. This increase is due to the very large number of staphylococcal cultures received for typing. Table 50 shows the number of specimens received from each health district together with the number for 1956.

Table 50

Year	Whangarei	Auckland	Hamilton	Rotorua	Gisborne	New Plymouth	Palmerston North	Wellington	Nelson	Greymouth	Christchurch	Timaru	Dunedin	Invercargill	Total
1957	102	2,808	82	423	506	157	382	2,986	122	21	233	50	378	8	8,258
1956	198	1,142	74	205	138	72	223	2,627	221	2	194	5	36	7	5,144

The remaining specimens originate from work initiated by the institute staff, 77 specimens examined for other Departments, and 17 from Niue Island, Samoa, and New Caledonia.

The general bacteriology section has examined 1,434 specimens, half of which were serum samples from cases of suspected leptospirosis. The leptospiral tests have been continued using the lysis/agglutination technique with 20 serotypes and, in addition, a trial was made of another test using sensitised erythrocytes. This additional test was performed in parallel with the standard lysis/agglutination test and gave reasonably concordant results. However, with the number of specimens examined here the new test provided no real advantages and has not been continued. Eleven different species were identified among the *Salmonellae* (food poisoning organisms) received and isolated; typhi-murium remains by far the commonest of the identified causes of food poisoning. One species, pensacola, was identified for the first time in New Zealand. Five different types of *Shigella* (dysentery organisms) were identified among the cultures received. At the request of the Wellington District Health Office a test of glass-washing machines was devised and used to test two models, both of which proved satisfactory.

### Virus Laboratories

The work of the serology section is summarised in Table 51.

Table 51

	Compliment Fixation Tests for										Total	
	Influenza			Adeno Virus	Psitta- cosis	Q Fever	LCM	Mumps	Toxo- plasma			
	A	B	C									
January to March ..	5	5	..	..	35	2	10	11	140	208		
April to June ..	11	11	..	..	34	2	7	4	125	194		
July to September ..	73	73	..	1	39	4	3	2	134	329		
October to December ..	7	7	2	4	50	1	3	2	112	188		
Totals ..	96	96	2	5	158	9	23	19	511	919		

Forty-eight sera were examined by the haemagglutination-inhibition test against four influenza virus strains. Three hundred and ninety-seven sera were examined by the toxoplasma dye test.

*Influenza*—Forty specimens were received for virus isolation. Ten influenza A viruses (Asian type) were isolated; Five further influenza A viruses isolated in Dunedin were sent to the institute. Ten of these viruses were sent to the World Influenza Centre in London, and in all cases the identification of the viruses as the Asian type was confirmed.

*Poliomyelitis*—Only 22 specimens were received for virus isolation and two type III viruses were isolated. Twenty-three serum samples were examined for poliomyelitis antibodies. As a special investigation, serum from 60 nine-year-old school children were examined for poliomyelitis antibodies. Their immunity state is shown in Table 52.

Table 52

Number Tested	Positive to All Three Types	Positive to Two Types			Positive to One Type			Negative to All Three Types
		I and II	II and III	I and III	I	II	III	
60	22	9	9	1	6	7	1	5

Sixty-three per cent had antibodies to type I, 78 per cent to type II, and 55 per cent to type III poliovirus. From 50 of these children a second serum sample was obtained one month after the second inoculation with poliomyelitis vaccine. Examination of these sera showed conversion rates of 83 per cent for type I, 91 per cent for type II, and 65 per cent for type III.

### Enteric Vi-phage Typing

Fifty cultures of typhoid bacillus were typed; six types were identified, A (1), C<sub>1</sub>(3), D<sub>1</sub>(12), D<sub>2</sub>(1), E<sub>1</sub>(17), and J(1); and six were untypable and three degraded.

### Hospital Infections and Bacteriophage Typing

There has been a very large increase in the number of specimens examined. The majority are cultures of staphylococcus for typing, other investigations include examination of throat and nose swabs and other specimens for staphylococci and streptococci, plate counts, and antibiotic sensitivities. A total of 5,704 cultures has been typed for hospitals. The largest number from any single hospital has been 2,237 cultures from the National Women's Hospital, Auckland.

The work of bacteriophage typing of staphylococcal cultures is summarised in table 53.

Table 53—*Staphylococcal Phage Typing Results*

Phage Group	Number Tested	Group				Type 80/81	Untypable	Unclassifiable
		I	II	III	IV			
<i>Source</i>								
Infections ..	2,227	237	167	366	4	1,278	139	36
Post-mortems ..	139	10	4	25	..	91	7	2
Adult nose swabs ..	1,700	395	178	448	3	406	213	57
Baby nose swabs ..	921	167	68	242	1	325	74	44
Umbilical swabs ..	186	37	14	65	..	61	3	6
Dust ..	426	83	14	80	1	72	144	32
Blankets ..	132	22	8	16	..	44	34	8
Others ..	78	17	10	13	2	15	18	3

Type 80/81 remains the commonest cause of hospital staphylococcal infections.

In addition to the work done for hospitals the appointment of Dr Knights has permitted the National Health Institute to extend its own investigations in this field. Thus, in conjunction with Wellington Hospital, the development and progress of the carrier state in nurses has been followed. Using an air slit sampler Dr Knights has conducted extensive investigations of the degree of air contamination in hospitals with special attention to maternity wards and maternity hospitals and their nurseries. These investigations have yielded interesting results but involving, as they do, considerations of hospital architecture, ventilation, organisation and staffing, have far reaching implications and all findings have to be checked and rechecked. The investigations are continuing.

The Research Officer, Dr Richardson, has continued his work on the nutrition of leptospirae and has made improvements in the preservation and standardisation of the complement fixation test reagents. At the request of the Division of Public Hygiene, arrangements, involving considerable preliminary work, have been made to undertake cholinesterase estimations on blood samples from persons exposed to the organic phosphorus insecticides.

### Vaccines

Forty-two litres of TAB vaccine were prepared, tested, and dispensed. A total of 26,300 doses of smallpox vaccine have been issued.

### Conclusion

I wish to thank all members of the staff for the willing and efficient manner in which they have worked throughout the year.

### MEDICAL STATISTICS BRANCH

This branch is in charge of Mr C. E. Gardiner, who reports on the year's work as follows:

A detailed account of the medical statistics for New Zealand is published as a yearly report by the branch, but certain figures for 1957 in addition to those in the comment which follows may be found in different parts of this report, namely:

- (1) Live and still births, infant, neo-natal, and maternal deaths: Table 38, page 92.
- (2) Causes of maternal deaths: Table 39, page 93.
- (3) Deaths from tuberculosis: Table 46, page 101.
- (4) Child hygiene statistics: Table 34, page 81.

### Principal Causes of Death

Certain causes of death and the rates per 1,000,000 of the population for Europeans and Maoris combined over a period of five years are shown in the following table. The causes of death have been classified in accordance with the International Classification of Diseases, Injuries, and Causes of Death (1948 revision) but, for the purposes of these tables, have been grouped to show the causes of death that are mainly responsible for mortality in New Zealand in recent years. All figures are provisional and are subject to minor alteration.

Maoris have been included in all figures contained in this report as it is considered that a summarised statistical survey should cover the whole population of New Zealand. In cases where race characteristics are important, separate figures can be obtained from the detailed statistics contained in the *Annual Report on Medical Statistics*.

*Table 54*

Causes of Deaths	Numbers of Deaths					Death-rates per 1,000,000 of Mean Population				
	1957	1956	1955	1954	1953	1957	1956	1955	1954	1953
Tuberculosis (all forms) ..	251	239	293	304	357	112	111	137	145	174
Syphilis and its sequelae ..	32	23	31	29	69	14	11	14	14	34
Acute poliomyelitis ..	2	51	29	..	27	1	23	14	..	13
All other infective and parasitic diseases ..	128	139	154	141	155	57	64	72	67	76
Malignant neoplasms ..	3,281	3,153	3,170	2,966	2,889	1,470	1,444	1,482	1,415	1,410
Diabetes mellitus ..	311	229	216	199	253	139	105	101	95	123
Vascular lesions of the central nervous system ..	2,584	2,316	2,325	2,305	2,292	1,157	1,061	1,087	1,100	1,119
Rheumatic fever and chronic rheumatic heart disease ..	274	239	252	255	294	123	109	118	122	143
Other diseases of the heart and hypertension ..	6,756	6,636	6,447	6,355	6,291	3,026	3,040	3,014	3,034	3,071
Influenza ..	179	89	28	80	41	80	41	13	38	20
Pneumonia ..	937	803	628	584	518	420	368	294	279	252
Bronchitis ..	517	441	460	419	332	232	202	215	200	162
Ulcer of stomach and duodenum	209	179	176	167	161	94	82	82	82	79
Nephritis and nephrosis ..	162	131	178	220	193	73	60	83	105	94
Motor-vehicle accidents ..	401	334	364	332	318	180	153	170	158	155
Other accidents ..	749	610	653	816	638	335	279	305	389	311
All other causes ..	4,089	4,084	3,821	3,704	3,526	1,832	1,869	1,786	1,768	1,721
Totals ..	20,862	19,696	19,225	18,876	18,354	9,344	9,023	8,988	9,010	8,958

Deaths from infectious diseases continued to decline during 1957. After the poliomyelitis epidemic of 1956 had disappeared this was to be expected as no outbreak of infectious disease had occurred other than influenza (which is classified under respiratory diseases). Tuberculosis continues in its downward trend through the period covered by the above table, except for a slight rise in 1957. Improvements in diagnosis and certification have no doubt contributed towards the constant rise in the recorded incidence of and mortality from malignant diseases, but these contributory factors must have become fairly stable by now. It is therefore somewhat disturbing to observe a constant increase in the mortality rate from cancer. The 1957 figure did not quite reach the highest peak attained in 1955. The gradual ageing of New Zealand's population whereby a greater proportion of people are entering the cancer danger years no doubt still influences the death rate from this cause and also that from other diseases of the later years of life. In 1957 there was a definite increase in the death rate from all the diseases of old age except diseases of the heart. As mentioned above there was an outbreak of influenza during 1957, chiefly of the Asian variety. Altogether 179 deaths were attributed to influenza, this being an increase of 90 over 1956. The death rate moved up to 80 per million of population as compared with 41 in 1956.

This epidemic of influenza attacked people of all ages but was particularly fatal amongst persons over 60 years of age. The numbers of deaths and death rates per 10,000 population are given in the following table by age, sex, and race.

Table 55

Age Group	Europeans		Maoris		Totals	
	Number	Rate per 10,000 Population	Number	Rate per 10,000 Population	Number	Rate per 10,000 Population
Under 1 year ..	13	2.57	15	24.34	28	4.95
1 and under 20 ..	15	0.21	10	1.37	25	0.32
20 and under 40 ..	14	0.25	4	1.09	18	0.31
40 and under 60 ..	8	0.18	6	3.64	14	0.30
60 and under 80 ..	49	2.03	13	28.99	62	2.52
80 and over ..	28	9.31	4	56.26	32	10.39
Totals ..	127	0.64	52	3.96	179	0.84

It will be seen that in proportion to population the Maori race was affected more heavily by the influenza epidemic than was the European. This applies to all age groups, and for both races the very old and the very young had the highest death rates.

The epidemic was of short duration as far as fatal incidence was concerned. There were only a few sporadic cases of death from influenza up to the end of July - a total of 19 during this period. The outbreak became intense during the next two months, 54 deaths occurring in August and 77 in September. From then on the disease quickly disappeared, there being 24 deaths in October and only five during the rest of the year. The epidemic was spread fairly uniformly throughout the country. The next table shows the number of deaths by months and health districts.

Table 56

Months 1957	Whangarei	Auckland	Hamilton	Rotorua	Gisborne	New Plymouth	Palmerston North	Wellington	Nelson	Greymouth	Christchurch	Timaru	Dunedin	Invercargill	New Zealand	
January to July ..	..	1	1	..	2	..	4	1	4	1	2	..	1	2	19	
August ..	..	16	10	4	7	..	9	3	..	2	..	1	..	..	54	
September ..	..	14	16	3	4	1	5	4	6	1	5	2	7	3	77	
October to December ..	..	3	..	..	3	..	7	1	1	..	2	..	5	6	29	
Totals ..	..	9	34	27	7	16	1	25	9	11	2	11	3	13	11	179

Only seven of the deaths ascribed to influenza were definitely certified as due to Asian or virus influenza, but 130, or 73 per cent, were specified as pneumonic influenza.

The other principal respiratory diseases, pneumonia and bronchitis, also showed substantial increases in the death rate during 1957 as compared with 1956. There were 937 deaths from pneumonia in 1957 and 517 from bronchitis, while the death rates were 420 and 232 per million of population respectively.

Both numbers and death rates for these diseases were the highest recorded in the period covered by the above table.

The death rate from accidents, particularly motor-vehicle accidents, continues to rise. Deaths from motor-vehicle accidents were the highest on record as regards both number of deaths and the death rate.

The total number of deaths from all causes during 1957 was 20,862, this figure being the highest ever recorded in New Zealand. The death rate of 9·34 per 1,000 of mean population was slightly higher than that for 1956.

### Infant Mortality

There was a rise in the infant mortality rate for 1957 as compared with 1956. The rate of 24·28 was, however, still in keeping with the low rates of recent years. The chief cause of the rise was the movement in the Maori rate, which increased from 54·36 in 1956 to 57·90 in 1957. The corresponding figures for Europeans were 19·39 in 1956 and 19·98 in 1957. This latter figure is the second lowest rate on record for Europeans.

*Table 57—Still Births and Infant Mortality Rates (European and Maori), 1953–57*

Period	European					Maori				
	Deaths per 1,000 Live Births			Rates per 1,000 Total Births		Deaths per 1,000 Live Births			Rates per 1,000 Total Births	
	Under 1 Month	1 and Under 12 Months	Total, Under 1 Year	Still Births	Still Births and Neo-natal Deaths	Under 1 Month	1 and Under 12 Months	Total Under 1 Year	Still Births	Still Births and Neo-natal Deaths
1957 ..	13·89	6·09	19·98	15·83	29·50	20·81	37·09	57·90	15·15	35·64
1956 ..	13·34	6·05	19·39	16·73	29·85	19·96	34·40	54·36	19·72	39·29
1955 ..	14·14	5·95	20·09	15·71	29·62	19·63	42·88	62·51	16·10	35·41
1954 ..	14·33	5·66	19·99	17·69	32·02	20·00	38·60	58·60	19·10	38·72
1953 ..	14·31	5·75	20·06	18·75	32·79	26·95	46·12	73·07	21·59	47·96

The neo-natal death rate (under one month) showed a slight increase in 1957 for both Europeans and Maoris. The still-birth rate, however, declined substantially for both races, with the result that the total neo-natal loss (still births and deaths under one month) showed an appreciable decline.

The principal causes of infant mortality (Europeans and Maoris combined) are shown in the next table.

*Table 58—Deaths of Infants Under One Year by Causes (European and Maori Combined)*

Principal Cause of Death	Numbers					Rates Per 1,000 Live Births				
	1957	1956	1955	1954	1953	1957	1956	1955	1954	1953
Influenza, pneumonia, and bronchitis ..	277	235	220	210	206	4·7	4·2	4·0	3·9	4·0
Gastro-enteritis, diarrhoea, and dysentery ..	54	44	67	55	69	0·9	0·8	1·2	1·0	1·3
Congenital malformation ..	197	210	214	231	199	3·4	3·7	3·8	4·3	3·8
Birth injury ..	169	172	175	129	159	2·9	3·0	3·1	2·4	3·1
Asphyxia and atelectasis ..	195	145	154	132	157	3·3	2·6	2·8	2·4	3·0
Haemolytic disease of newborn ..	28	39	40	45	42	0·5	0·7	0·7	0·8	0·8
Immaturity ..	208	183	202	242	204	3·6	3·2	3·6	4·5	3·9
Other ..	292	285	293	258	299	5·0	5·1	5·3	4·8	5·8
Totals ..	1,420	1,313	1,365	1,302	1,335	24·3	23·2	24·5	24·1	25·7

Immaturity is still a high cause of infant loss, with the rate showing a rise in 1957 as compared with 1956. Deaths assigned to this cause alone totalled 208 in 1957 as compared with 183 in 1956. When all deaths in which immaturity was named as a contributing factor (as shown in the next table) are taken into account the increase was 30.

Table 59—Deaths of Infants Under One Year

A = Under one month.      B = One month and under one year.  
 (Figures in parentheses denote those where prematurity was mentioned associated with death.)

—	European				Maori			
	1954	1955	1956	1957	1954	1955	1956	1957
Influenza, pneumonia, A and bronchitis	34 (8)	21 (9)	36 (10)	30 (5)	7 (2)	3 (3)	6	16 (7)
	B 71 (3)	79 (2)	82	103	97 (1)	117	111	128
Gastro-enteritis, diarrhoea, and dysentery	A 1 (1)	3	1	3	.	1	2	1
	B 15 (1)	11	15	10	38 (1)	54 (1)	26	40
Congenital malformation	A 124 (9)	111 (17)	95 (13)	96 (17)	10	7 (1)	15 (2)	11
	B 84 (1)	85 (2)	89	73 (3)	7	11	11	17
Birth injury ..	A 107 (35)	142 (61)	141 (67)	133 (58)	18 (8)	30 (18)	28 (14)	30
	B 1	2	2	5	1 (1)	1	1 (1)	1
Asphyxia and atelectasis	A 108 (49)	136 (80)	126 (75)	162 (101)	22 (4)	16 (8)	17 (8)	31 (9)
	B 3 (1)	1	2	2 (1)	.	1	.	.
Haemolytic disease of newborn	A 37 (13)	39 (18)	37 (11)	24 (2)	4 (1)	..	..	2
	B 1	1	2	1	1 (1)	..	..	1
Immaturity ..	A 201	162	143	178	42	40	40	28
	B 2	.	.	1	1	.	.	1
Other ..	A 82 (35)	91 (29)	94 (29)	94 (36)	11	17 (3)	16 (4)	19
	B 97	118 (1)	113	121	75	65	62	58
Totals ..	A 694	705	673	720	114	114	124	138
	B 274	297	305	316	220	249	211	246

J. D. MANNING,  
 Director, National Health Institute.

## REPORT OF THE DIRECTOR OF WELFARE SERVICES

In August 1957 approval was given for the grouping of all the Department's work relating to the care of the aged, erection of youth hostels, rehabilitation, and general welfare work under a Director of Welfare Services.

### CARE OF AGED

#### Advisory Committee on the Care of the Aged

The committee met on two occasions during the year and dealt with a wide variety of matters relating to the welfare of old people. The committee continues to be a most useful organisation and its advice on the matters submitted to it is greatly appreciated by the Department.

#### Seminars on the Care of the Aged

During the year approval was given for the organisation of a series of seminars dealing with various aspects of the care of the aged. The first seminar is to be held for matrons, managers, and assistant matrons of old people's homes, in Wellington during April 1958.

#### Accommodation for Old People

(i) *Religious or Welfare Organisations*—During the year religious or welfare organisations were granted subsidies totalling £694,034 to assist them to provide accommodation for 529 old people. The total subsidies and grants approved under this heading since April 1950, when the present policy was initiated, amount to £1,896,981, and the total number of old people who will be accommodated is 2,209. In addition the Department is providing loan finance amounting to £63,657.

(ii) *Local Authorities*—Subsidies totalling £182,045 and loans totalling £217,345 have been granted to local authorities during the year ended 31 March 1958 to assist them to build cottages or flats for 374 old people. Up to this date the total subsidies approved since the inception of the scheme amount to £523,135 and the total loans approved amount to £697,310. With this assistance local authorities will be providing accommodation in cottages or flats for 1,205 old people.

#### Meals on Wheels for Old People

During the year under review six additional schemes were approved for the supply of meals to old people living in their own homes. As at 31 December 1957 there were 15 separate meals on wheels schemes in operation throughout New Zealand, and altogether 496 old people were being supplied with meals in their own homes. With only one exception the general tendency has been for additional old people to be included in each scheme.

#### Laundry Service for Old People

In May 1957 Cabinet decided as a matter of policy that hospital boards should be authorised to provide a limited laundry service for old people in their own homes where there is a need for a service of that nature. Up to 31 December 1957 six schemes had been approved and a laundry service was being provided for 105 old people.

### General

In June 1957 Cabinet approved of the payment of a grant to the Christchurch Aged People's Welfare Council to enable that body to establish an experimental occupational therapy service for old people in Christchurch. The Department is satisfied that the service is desirable and hopes that it will be possible for it to be continued.

Two issues of the Department's newsletter for organisations and individuals interested in the welfare of old people ("The Later Years") have been published during the year.

### REHABILITATION

The opening of the Health Recovery Centre at Otahuhu by the Auckland Hospital Board has been a step forward in the establishing of civilian rehabilitation services in New Zealand.

Two-thirds of the capital cost of the centre was borne by the Workers' Compensation Board, which has been vitally interested in the project since its inception.

The centre makes provision for the treatment of 25 male inpatients and 25 outpatients, with provision for future expansion.

### MISCELLANEOUS WELFARE SERVICES

#### Accommodation for Young People

In July 1957 Cabinet decided to modify the policy under which religious or welfare organisations could be granted subsidies toward the cost of providing accommodation for young people.

The modifications were—

- (1) In future the maximum subsidy payable is to be limited to £600 per young person accommodated, exclusive of staff:
- (2) Except in the case of bona fide full-time university students, priority for admission to a hostel must be given to young people 23 years of age and under, even though this means that a young person in a hostel over that age must be asked to find other accommodation.

During the year, subsidies totalling £114,683 have been approved to assist in providing accommodation for 162 young people. Since this policy was initiated in 1951 subsidies totalling £266,739 have been approved and the buildings erected or to be erected will accommodate 457 young people.

#### Short-stay Homes for Intellectually Handicapped Children

No subsidies were approved during the year ended 31 March 1958 to assist in providing short-stay accommodation for intellectually handicapped children. The total subsidies which have been approved since this policy was adopted in 1954 amount to £13,475 and have resulted in the provision of short-stay accommodation for 41 intellectually handicapped children.

G. O. L. DEMPSTER,  
Director of Welfare Services.

## REPORT OF THE DIRECTOR, DOMINION X-RAY AND RADIUM LABORATORY

During the year under review the number of X-ray plants in New Zealand increased by a further 49. The use of radioactive substances showed a very much sharper increase, 78 per cent more orders being placed than during the previous year. The use of Gold 198 and Sulphur 35 increased over seven- and nine-fold respectively, and the number of orders placed for Iodine 131, Phosphorus 32, and Chromium 51 increased by 51 per cent, 103 per cent, and 200 per cent respectively. This sharp increase in the use of radioactive substances for medical-and research purposes also caused a very heavy increase in the work of the laboratory's physicists - to such an extent that the present staffing of the sections concerned can no longer be considered adequate.

In February 1958 a report on some aspects of radiation protection in New Zealand had to be prepared for the United Nations Scientific Committee on the Effects of Atomic Radiation. This report consisted of three parts:

- (1) A description of the organisation of radiation protection in New Zealand. This included information on relevant legislation, and gave detailed data on the extent to which X-ray plants and radioactive substances are used in this country:
- (2) An evaluation of the effectiveness of radiation protection measures taken in New Zealand, as shown by the results of routine monitoring of radiation workers in New Zealand over a period of years:
- (3) Preliminary results of part of a programme aimed at determining the gonad dose received by the population of New Zealand from diagnostic X-ray examinations. This part of the report comprised—
  - (a) Demographic statistics (age distribution of population, and mean future number of children) prepared by the Department of Statistics specifically for this radiological survey; and
  - (b) Analysis (by age and sex of patient, and by site of examination) of 180,475 diagnostic X-ray examinations made in New Zealand during the period April, May, and June 1957 (excluding dental radiography and shoe-fitting exposures).

The information given under (2) and under (3) (b) was of particular interest.

The data listed under (2) gave a good indication of what has been achieved in New Zealand over the last few years by guiding radiation users towards safer working habits. An objective measure of the effectiveness and of the value of our radiation protection programme is given by the results of the routine radiation test films issued regularly, free of charge, to all persons occupationally exposed to radiation. The report to the United Nations Committee gave the results over a six-year period

but, after submitting this report, the radiation test film results for the year under review became available and have been included in the figures given in Table 60.

*Table 60—Analysis of the Exposures Received by the Radiation Test Films Evaluated During the Last Seven Years: Exposures are Expressed as a Percentage of the Maximum Permissible Weekly Exposure (M.P.W.E. = 0·3r.)*

	Per Cent	Percentage of Films Within Exposure Range (Year Ended 31 March)						
		1952	1953	1954	1955	1956	1957	1958
Films worn by X-ray workers showed exposures of	0-5 ..	78·3	79·0	78·9	79·4	83·8	90·4	94·77
	6-10 ..	11·6	11·5	11·8	11·3	9·7	6·1	3·45
	11-20 ..	6·7	5·8	6·2	6·3	4·4	2·5	1·10
	21-33 ..	2·2	1·9	1·8	1·6	1·1	0·6	0·35
	34-66 ..	0·83	0·92	0·93	0·82	0·56	0·26	0·15
	67-100 ..	0·33	{ 0·82	{ 0·12	0·18	0·17	0·03	0·04
	Over 100 ..	0·12	{ 0·82	{ 0·28	0·42	0·23	0·11	0·14
Films worn by radium workers, industrial radiographers, and deeptherapy technicians, showed exposures of	0-5 ..	..	..	32·2	59·8	67·3	74·5	82·67
	6-10 ..	..	..	17·3	15·6	15·4	13·0	8·97
	11-20 ..	..	..	22·2	10·2	9·0	5·9	4·71
	21-33 ..	..	..	11·3	5·2	3·1	2·6	1·54
	34-66 ..	..	..	9·6	6·4	2·8	2·5	1·57
	67-100 ..	..	..	2·9	1·5	0·89	0·85	0·31
	Over 100 ..	..	..	4·5	1·3	1·5	0·67	0·23
Films worn by X-ray workers showed exposures of	Above 5 ..	21·7	21·0	21·1	20·6	16·2	9·6	5·23
	Above 10 ..	10·1	9·4	9·4	9·3	6·5	3·5	1·78
	Above 20 ..	3·4	3·6	3·13	3·02	2·06	1·0	0·68
	Above 33 ..	1·28	1·7	1·33	1·42	0·96	0·40	0·33
	Above 66 ..	0·45	0·82	0·40	0·60	0·40	0·14	0·18
Films worn by radium workers, industrial radiographers, and deep-therapy technicians showed exposures of	Above 5 ..	..	..	67·8	40·2	32·7	25·5	17·33
	Above 10 ..	..	..	50·5	24·6	17·3	12·5	8·36
	Above 20 ..	..	..	28·3	14·4	8·3	6·6	3·65
	Above 33 ..	..	..	17·0	9·2	5·2	4·0	2·11
	Above 66 ..	..	..	7·4	2·8	2·4	1·52	0·54

The table provides a detailed analysis of 115,348 radiation test films worn by New Zealand radiation workers and evaluated during the seven-year period 1 April 1951 to 31 March 1958. It shows rather clearly how the present remarkably low doses received by radiation workers have been gradually approached, and they allow a comparison with relevant figures published overseas. The latest such set of data is given in the results of a radiation test film service covering 400 radiologists, radiographers, and radium workers in Scotland. There, during the closing months of last year, an analysis of 1,100 consecutive radiation test films was made, with the following result:

Percentage of M.P.W.E. (300 mr/week)	Percentage of Films Falling in This Group
Under 8·3 per cent .. .. ..	51·4 per cent
8·3-16·7 per cent .. .. ..	25·0 per cent
16·7-33·3 per cent .. .. ..	15·8 per cent
33·3-66·7 per cent .. .. ..	4·4 per cent
66·7-100 per cent .. .. ..	2·0 per cent
Over 100 per cent .. .. ..	1·4 per cent

These figures are considerably higher than the New Zealand figures, even though the New Zealand film test results are heavily biased by the exposures recorded from those radiation workers who habitually receive higher exposures.

In New Zealand, radiation test films are no longer issued to all radiation workers on the same basis. Where the results of many previous film checks, confirmed by the results of the field survey, have shown clearly and beyond any possible doubt that a worker never receives – or can receive – more than an insignificantly small fraction of the maximum permissible exposure (say less than 1–2 per cent), then the routine film tests for this worker are reduced to about three to four films a year. On the other hand, those workers who usually receive higher exposures are kept on continuous tests. This necessarily introduces into analysis of the results of the test films a bias towards a higher average than the true average which would have been recorded if films had been worn with equal frequency by all radiation workers.

While it is thus not possible to arrive at an average value for the exposures received by all our radiation workers, we can be sure, from our film tests and radiation surveys, that the average must be considerably lower than 2·8 per cent m.p.w.e. for X-ray workers, and 8·4 per cent for radium workers. We know that last year 12,623 films (out of 16,131 in the exposure range 0–5 per cent m.p.w.e.) actually received less than 1 per cent m.p.w.e. If we then assume the worst possible condition, i.e., that all films in any single group had received the maximum exposure for that group, and if we assume that all films over 100 per cent had received 250 per cent m.p.w.e., we find that the average exposure of all films used by X-ray workers would be less than 2·88 per cent m.p.w.e., while the average exposure of all films used by radium workers, industrial radiographers, and deep-therapy technicians would be less than 8·42 per cent m.p.w.e.

The data submitted under (3) (b) to the United Nations Committee provided a detailed analysis of over 70 per cent of the total number of about 257,000 diagnostic X-ray examinations which were made in New Zealand during the three-month period investigated (excluding dental examinations). Such an analysis is necessary because any attempt at assessing the genetic load of radiation from diagnostic X-ray exposures to the population of a country must be based on reliable information on the number of diagnostic X-ray examinations carried out on different anatomical sites, and on patients within certain age groups of both sexes.

Attempts at such an analysis have been made overseas, but the absence of adequate records made it necessary to confine such analysis to relatively small – and not necessarily representative – numbers. For example, in the British White Paper on "The Hazards to Man from Nuclear and Allied Radiations" the number of diagnostic examinations analysed was less than 1 in 800 of the annual number of examinations for the country as a whole.

New Zealand is probably the only country in the fortunate position of having not only full records of all diagnostic X-ray plants, but also a system of medical services which permits a quantitative assessment of virtually all diagnostic X-ray work done. The detailed analysis carried out on over 187,000 diagnostic X-ray examinations will therefore provide useful basic information.

During the year under review the Deputy Director of the Laboratory was one of the official observers at the Christmas Island nuclear tests, and later in the year the laboratory was made responsible for routine fall-out monitoring. This matter will be referred to later when describing the work of the Radioactive Substances Section.

A brief survey of the work done in the various sections of the laboratory follows, arranged alphabetically under individual section headings.

### Clerical Section

Over the last few years the staff of the Clerical Section has taken an increasing part in the processing of radiation test films. During the year, after a careful investigation, it was found possible to simplify the recording work while preserving the essential details required. An appreciable saving of time was effected and the new simplified system has proved satisfactory in the four months since the changeover.

During the year the staff of this section performed all the clerical work associated with the preparation of figures used in the survey of genetically significant radiation for the United Nations Scientific Sub-Committee.

All darkroom work is now done by the clerical staff. Apart from the processing of 20,846 radiation test films, this work included the micro-filming of 1,891 pages, printing 2,977 pages, and enlarging 168 prints.

The work associated with the ordering of radioactive substances for all New Zealand users is increasing steadily each year. Since the laboratory took over this work the annual orders have quadrupled.

The library service provided 103 loans of publications to departmental and others users and it maintains the distribution of 61 technical periodicals.

### Diagnostic Section

During the year under review the two physicists in this section have checked a total of 786 X-ray plants, of which: 233 were medical diagnostic plants; 421 were dental diagnostic plants; 38 were chiropractic diagnostic plants; 18 were veterinary diagnostic plants; 53 were shoe-fitting plants; 23 were industrial, experimental, educational or research plants.

The X-ray plants included in last year's routine surveys were located in the Provinces of Canterbury, Otago, Southland, Hawke's Bay, Taranaki, Wellington, Auckland, and Northland. In addition, special visits by physicists from this section were made to investigate suspected cases of overexposure to radiation. A scheme was put forward to eliminate the possibility of hazards arising from school demonstration X-ray plants and, with the assistance of the RNZAF, a visit was paid to the Chatham Islands to check possible radiation hazards during the operation of a small X-ray plant there. The visiting of all these X-ray plants entailed some 25 week's travelling by the two officers concerned and, while engaged in field work, an average of 55–60 hours per week was worked by the physicists.

Mention has been made elsewhere in this report of the marked reduction in the occupational exposure received by radiation workers in New Zealand.

The efforts of the physicists in educating radiation workers, and the practical help and instruction given by them to radiation workers, are largely responsible for these good results.

Considerable work has also been done by the physicists of this section to bring about a reduction of the X-ray dosage to patients in many diagnostic procedures by such means as added filtration, the use of higher kilovoltage and faster films. In some cases patient dosage

has been reduced to about a twentieth of the original patient dose while still retaining all the required diagnostic detail in the resultant film.

Further improvements can be made, and work in this field is being continued.

### Radioactive Substances Section

The field work by this section during the year included a complete tour of all North Island users of radioactive substances and also visits to some sections of the South Island. The 36 establishments visited used radioactive substances for such diversified work as clinical use of radium in hospitals, industrial measuring equipment, industrial gamma-ray radiography, luminising of instruments, teaching, and research. A special trip was necessary to endeavour to locate radium lost from a hospital. Lectures were given to the Horological Society on the safe handling of radioactive luminous compounds and to the United Fire Brigades' Association on the hazards associated with radioactive materials which may be involved in a fire.

Advice and assistance were given to two hospitals in the setting up of equipment for the clinical use of radio-iodine, and special investigations were carried out at two hospitals to reduce exposure of radiation workers during the use of radium for therapeutic purposes. A greatly increased amount of advisory work was necessary due to the sharply increased use of radio-active substances not only for clinical but also for industrial teaching, and research purposes. In addition, advice and assistance had to be given on such diverse subjects as uranium prospecting; the use of a neutron source and detector in soil moisture measurements; the use and dispensing of Sulphur 35 for agricultural experiments, and the irradiation of seeds by means of a radioactive source.

Again during this year a number of samples of various materials were received from persons who suspected that the materials were radioactive. In only one case did this prove to be true. This was a luminous indicator containing a quantity of Sr 90, which was found in a rubbish tin, and which would have been extremely dangerous if it had been damaged. It was found by the Police Department that this indicator was one of a number which had been taken as souvenirs from a visiting overseas ship, and the Police Department cooperated in recovering others.

Four special types of Sr 90 beta-ray medical applicators were obtained by the laboratory, and are available for loan to radiotherapists throughout the country.

Detailed notes on safety precautions in industrial gamma radiography and in the use of radio-iodine were prepared for circulation to users, and this work will be extended to cover all major uses of radioactive substances in the country.

An investigation was made to determine whether a central dispensing service for the commonly used radioactive isotopes would be justified.

During the year this laboratory commenced work measuring radioactive fall-out in order to determine any possible hazard to the population of New Zealand. A start has been made on the measurements of radioactivity in rainwater and in the atmosphere. To assist in this work, and to carry out a programme of analysis on soils and biological

materials, a chemist has been appointed to this section. A further development in this field has been the analysis for possible radioactivity of specimens of fish and plankton from the islands in the Pacific.

The supply of radon from the laboratory involved the despatch of 84 consignments of radon totalling 1,466 millicuries, measured at the time of insertion, in 1,144 containers. Orders received totalled 70, of which 60 were from hospital boards, six from private medical practitioners, and four from research workers.

The radon was despatched in the form of 65 needles, 1,056 seeds, four pieces of gold tubing, 15 phials of ointments, and four special applicators.

### Therapy Section

This section (staffed by two physicists) is associated directly or indirectly, with the 55 X-ray therapy plants in New Zealand. The section provides the whole physical service required by 32 of these units. For the remainder, assistance is given by regular biannual dosimetric calibrations and (in cooperation with hospital physicists) additional plant calibrations, occasional basic measurements of a new plant's performance, and the investigation of special features or techniques. The New Zealand total of 55 X-ray therapy plants is composed of two supervoltage units (a 4 meV linear accelerator at Auckland, and a 2,000 curies cobalt unit at Christchurch), 16 deep-therapy plants in the 200–300 kV range, and 37 superficial X-ray therapy plants (comprising five Grenz-ray plants, six contact therapy plants, two Be-Window 30–100 kV plants, and 24 conventional superficial therapy units). Subdivided further, 32 units are located in the North Island and 23 in the South Island; 27 plants are publicly owned and 28 privately owned.

The Therapy Section's activities extend from the results of the laboratory's primary standard dosimetry (and its overseas linkage) to the physical aspects of radiotherapeutic treatment. The section ensures the stability of, and introduces current developments in, secondary standard dosimetry; secondary standards are applied either via a biannual inter-comparison of 15 hospital doseometers or by directly checking clinical treatment charts; and finally, basic physical data is applied to specific treatment plans in cooperation with clinicians.

Activities during the year have included: the reintroduction of two damaged hospital doseometers (repaired by our workshops); design of treatment applicators; barrier protection designs; initial calibrations of the Auckland Hospital Konrad Deep-therapy plant, and the 4 meV linear accelerator; and two searches, together with the Radioactive Substances Section, for lost radium applicators.

Development projects included: Secondary standard dosimetric intercomparisons in the soft X-ray and supervoltage regions; assistance with an investigation of temperature and pressure factors and strontium standard checks on doseometers; the rearrangement of clinical treatment charts into terms of tissue dose; and investigations of foetal and scrotal doses associated with superficial X-ray therapy treatment plans.

A paper reviewing time-dose studies was read at the New Zealand Dermatological Society meeting at Hamilton, September 1957, by Mr H. R. Atkinson, who also attended this society's annual meeting at Dunedin, February 1958. This section's routine information and

advisory services were extended this year with the issue of abstracts from radiological journals on the physical aspects of superficial X-ray therapy. The paper "Tissue Dosage in Dermatological X-Ray Therapy" by H. R. Atkinson read at the New Zealand Dermatological Society meeting at Napier, September 1956, has since been published in the *Australian Journal of Dermatology* June 1957, Vol. IV, No. 1, pages 11-12.

### Workshop Section (Electronic and Mechanical)

The smooth working of this laboratory, with its many diversified duties and the wide variety of instruments it uses, is very dependent on an efficient workshop staff which can not only maintain the equipment in perfect order but which can also – often at very short notice indeed – produce intricate new electrical, electronic, or mechanical equipment. The laboratory is very fortunate indeed to have a team of keen, intelligent, experienced, and resourceful technicians who have been able to meet all the heavy demands made on their skill and ingenuity.

In this short report there is no space to list the dozens of new projects the workshop staff completed during the year, quite apart from the routine maintenance work. However, the complicated work on additions to the X-ray Standards Chamber, the setting up of a new radon microdetermination plant, and the building of an electrometer-ratemeter have to be specially mentioned.

In addition to its work for the laboratory the workshop had to undertake the repair of two clinical dosimeters belonging to different hospitals, and the modifications of a third instrument.

### X-ray Standards Work

During the later part of the year under review a large programme of dosimeter calibrations was undertaken on the laboratory's primary X-ray standards equipment. A total of 11 clinical dosimeters, having 20 thimble chambers associated with them, were calibrated at as many as 21 "Quality" settings, covering the range between 0·1 mm Al H.V.L. and 4·43 mm Cu. H.V.L.

### ACKNOWLEDGMENT

In conclusion, I wish to thank the staff of the laboratory for their hard and willing work and for their unfailing cooperation, and the departmental officers whose help and cooperation greatly assisted the work of the laboratory.

G. E. ROTH,

Director, Dominion X-ray and Radium Laboratory.

## APPENDIX

### POLIOMYELITIS IN NEW ZEALAND

By Cedric E. Gardiner, Statistician.

Compared with some countries, the incidence of poliomyelitis in New Zealand has not been high except for the periods of major epidemics. Nevertheless the disease is always with us and in some years between epidemics the total number of cases has reached close on and sometimes over a hundred. In view of the recent introduction of the programme of vaccination against poliomyelitis, it is considered of value to review the history of the disease in New Zealand and, in particular, to publish certain statistical tables and comments covering the latest epidemic which flared up in August 1955 (with a few sporadic cases in earlier months), and finally died away about July 1956.

To preserve uniformity this report follows closely the lines laid down by Dr F. S. Maclean, former Director of the Public Hygiene Division of the Department of Health, in relation to the major epidemics of 1947–49<sup>1</sup> and 1952–53<sup>2</sup>. Preliminary figures relating to the 1955–56 epidemic were given in the annual reports of the Department of Health for the years 1956 and 1957. The figures given in this present review have been corrected and show a slight variation from the preliminary figures previously published.

The 1955–56 outbreak marks the sixth major epidemic of poliomyelitis experienced in New Zealand during the present century. The earlier history of the disease during this period suggested that outbreaks reaching a total of a 1,000 cases might be expected at roughly 10-year intervals. This established cycle, however, has definitely been broken in more recent years. The fifth epidemic of these proportions occurred three years after the previous one, while the sixth commenced barely two years later. A feature of both the 1952–53 and the 1955–56 epidemics was the unusual seasonal outbreak of the disease. All previous epidemics had a rapid rise in incidence in the summer months and declined as winter drew on. In 1952 poliomyelitis had been showing signs of increasing intensity during the early winter months, became fully epidemic in August, and finally dwindled as an epidemic almost a year later. Similarly in 1955 it became apparent in August that poliomyelitis was once more rapidly on the increase and it was not until July 1956 that the incidence became more normal.

Another point of similarity between the two recent epidemics was the rapid spread through the country. In both instances the disease started in the North Island and three months later was very apparent in the South Island. In 1955 most of the North Island districts were hit simultaneously but in the South Island Dunedin had a high incidence well before the other South Island areas.

The total number of cases recorded during 1955 and 1956 and surveyed in this review was 1,485, the majority of which occurred between August 1955 and July 1956. This total makes the 1955–56 epidemic

the most severe on record as far as total incidence is concerned. All notifications of poliomyelitis received during this period were carefully checked and all those not considered to show clinical or pathological evidence of poliomyelitis were rejected. The final figure of 1,485 positive cases includes 925 cases showing evidence of paralysis or paresis. These figures include both European and Maori cases. This gives a total incidence rate of 6·8 and a paralysis rate of 4·3 per 10,000 of population. Although the total incidence is the highest on record, the actual attack rate is not so high as in previous epidemics.

Table I shows the incidence by months in each year from 1915–1956. These figures include all notifications received during each year.

*Table I—Poliomyelitis, 1915–56: Distribution by Months*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
1915 ..	119	1	..	1	..	1	2	..	..	..	1	4	10
1916 ..	319	320	167	44	19	9	5	4	4	4	4	4	1,018
1917 ..	10	2	3	4	5	..	3	2	18	5	5	2	54
1918 ..	1	1	1	1	..	1	1	..	..	..	..	..	6
1919 ..	1	2	..	1	1	3	..	2	..	..	..	1	11
1920 ..	2	1	17	14	7	5	2	5	10	4	9	76	..
1921 ..	46	84	60	26	12	3	3	6	3	5	9	10	267
1922 ..	21	20	21	14	4	5	3	2	2	3	2	1	98
1923 ..	5	1	4	..	3	1	..	1	2	..	..	..	17
1924 ..	2	2	..	..	1	1	1	..	2	5	59	73	..
1925 ..	224	340	366	120	54	22	10	9	6	5	3	..	1,159
1926 ..	4	4	1	..	..	1	1	2	..	1	8	22	..
1927 ..	3	5	5	4	4	2	2	..	..	..	2	2	29
1928 ..	5	5	11	11	4	1	..	1	3	2	2	2	47
1929 ..	3	10	14	9	6	6	1	3	2	..	1	..	55
1930 ..	1	3	..	..	1	1	1	1	1	1	..	2	12
1931 ..	2	1	2	1	..	1	4	2	3	4	4	1	25
1932 ..	12	31	39	23	8	6	1	8	5	2	7	8	150
1933 ..	10	4	15	9	2	..	1	..	1	..	2	1	45
1934 ..	..	3	1	2	2	..	1	1	..	2	1	1	14
1935 ..	1	1	1	1	..	..	..	1	..	2	..	1	8
1936 ..	..	..	..	..	1	..	..	..	14	..	1	85	87
1937 ..	70	53	107	244	163	95	30	14	14	10	11	5	816
1938 ..	9	1	3	8	1	..	..	..	..	..	..	..	22
1939 ..	3	2	2	11	7	9	4	2	1	2	3	4	50
1940 ..	5	5	3	..	1	..	2	2	1	4	..	..	23
1941 ..	..	1	1	..	..	1	..	1	..	..	..	..	4
1942 ..	..	1	4	3	4	5	1	..	3	3	5	2	31
1943 ..	..	10	38	59	23	7	2	3	15	14	4	4	179
1944 ..	19	8	11	5	1	..	..	..	..	..	..	1	45
1945 ..	..	1	2	..	1	2	1	..	2	1	2	4	16
1946 ..	26	23	9	22	14	8	6	4	..	1	..	..	113
1947 ..	3	1	2	..	1	..	1	..	..	1	17	109	135
1948 ..	55	43	76	96	117	64	85	85	117	77	80	69	964
1949 ..	94	66	84	33	18	10	11	7	5	8	9	10	355
1950 ..	6	9	18	5	5	9	3	1	4	1	7	2	70
1951 ..	4	1	1	5	3	..	..	1	1	4	3	3	26
1952 ..	1	5	7	12	7	15	51	76	121	203	206	190	894
1953 ..	179	107	45	23	17	4	2	3	7	7	11	3	406
1954 ..	2	3	9	2	3	5	9	1	2	1	2	4	43
1955 ..	16	17	2	1	6	4	6	31	51	105	246	218	703
1956 ..	266	218	171	106	42	20	16	10	9	11	17	11	897

### Progress of the 1955–56 Epidemic

The first indication that poliomyelitis was likely to reach epidemic proportions was observed in August 1955 when cases began to appear in Auckland and Hamilton areas in the north and as far down as New Plymouth in the west. Indeed, New Plymouth may almost be considered to have been the real source of the outbreak as in proportion to population the number of cases reported from this area was higher than anywhere else and remained so until the end of November, by which time the disease had spread to Palmerston North and Wellington as well as

all over the north and east in the North Island. A strange feature was the fact that Dunedin was hit fairly heavily as early as October, whereas it was not until December that other South Island districts such as Timaru and Invercargill had more than a few sporadic cases. Again, Whangarei in the far north saw little of the epidemic until early in 1956. By this time the whole country had been affected with a particularly high incidence from Palmerston North down through the remainder of the North Island and all through the South Island. Timaru was severely affected during January 1956, Christchurch for the first three months of that year, and Nelson in February and March.

*Table II—Attack Rates by Health Districts, 1955–56 Epidemic*

Health Districts	Population Census 1956	Total Cases		Paralysed Cases		Deaths		
		Number	Rate per 10,000 Population	Number	Rate per 10,000 Population	Number	Rate per 10,000 Population	
Whangarei ..	..	83,330	33	4·0	20	2·4	1	0·1
Auckland ..	..	440,798	151	3·4	82	1·9	4	0·1
Hamilton ..	..	218,410	66	3·0	43	2·0	1	..
Tauranga ..	..	61,316	68	11·1	36	5·9	4	0·7
Gisborne ..	..	85,532	70	8·2	45	5·3	3	0·4
New Plymouth ..	..	83,778	141	16·8	98	11·7	9	1·1
Palmerston North ..	..	250,001	159	6·4	108	4·3	8	0·3
Wellington ..	..	274,199	170	6·2	91	3·3	4	0·1
Total, North Island		1,497,364	858	5·7	523	3·5	34	0·2
Nelson ..	..	68,367	124	18·1	56	8·2	7	1·0
Greymouth ..	..	39,047	25	6·4	19	4·9	2	0·5
Christchurch ..	..	243,073	140	5·8	84	3·5	6	0·2
Timaru ..	..	91,525	112	12·2	72	7·9	8	0·9
Dunedin ..	..	146,219	153	10·5	114	7·8	6	0·4
Invercargill ..	..	88,467	73	8·3	57	6·4	10	1·1
Total South Island ..		676,698	627	9·3	402	5·9	39	0·6
New Zealand ..	..	2,174,062	1,485	6·8	925	4·3	73	0·3

In proportion to population, Nelson Health District suffered most in the 1955–56 epidemic. As mentioned earlier, the disease was late in spreading to Nelson but was of rather an explosive nature in that area during the late summer. New Plymouth, where the outbreak appeared to originate, had the second highest total incidence rate (16·8). The South Island, with a total rate of 9·3 per 10,000 population, undoubtedly suffered more than the North Island (5·7). This remark applies also to the severity of the disease. The North Island paralysis rate was only 3·5 as compared with 5·9 for the South Island, while the death rate in the South (0·6), was exactly treble that of the North (0·2). In both these latter respects, New Plymouth and Nelson were the Districts with comparatively high rates, although Invercargill had an equally high death rate with New Plymouth (1·1). Hamilton had the lowest total attack rate (3·0), with Auckland second (3·4). These positions were reversed as far as paralysis incidence is concerned. For death rates, Whangarei, Auckland, and Wellington had equally low rates (0·1), while Hamilton was the lowest with a rate of less than 0·1 per 10,000 of population.

The details of all cases, paralysed cases and deaths, are shown by health districts, sex, and age-groups in Tables III to V.

### Poliomyelitis, 1955-56

*Table III—All Cases, Health Districts, by Sex and Age Groups*

Health District	Sex	Age Group						Totals
		0-4	5-9	10-14	15-24	25-34	35 and Over	
Whangarei .. ..	M. ..	3	1	6	2	3	1	16
	F. ..	2	3	1	6	4	1	17
	Totals	5	4	7	8	7	2	33
Auckland .. ..	M. ..	8	23	18	14	14	3	80
	F. ..	6	13	8	25	16	3	71
	Totals	14	36	26	39	30	6	151
Hamilton .. ..	M. ..	7	5	3	9	7	4	35
	F. ..	8	2	5	8	7	1	31
	Totals	15	7	8	17	14	5	66
Tauranga .. ..	M. ..	2	9	2	2	9	7	31
	F. ..	1	7	3	10	13	3	37
	Totals	3	16	5	12	22	10	68
Gisborne .. ..	M. ..	7	8	4	5	7	7	38
	F. ..	6	7	3	7	9	..	32
	Totals	13	15	7	12	16	7	70
New Plymouth .. ..	M. ..	23	18	10	7	13	7	78
	F. ..	16	13	6	13	10	5	63
	Totals	39	31	16	20	23	12	141
Palmerston North .. ..	M. ..	18	20	5	12	16	5	76
	F. ..	15	15	6	20	20	7	83
	Totals	33	35	11	32	36	12	159
Wellington .. ..	M. ..	22	12	8	21	21	7	91
	F. ..	18	8	7	18	26	2	79
	Totals	40	20	15	39	47	9	170
Nelson .. ..	M. ..	9	27	10	14	7	6	73
	F. ..	6	13	9	8	11	4	51
	Totals	15	40	19	22	18	10	124
Greymouth .. ..	M. ..	3	4	..	3	..	1	11
	F. ..	3	3	1	4	3	..	14
	Totals	6	7	1	7	3	1	25
Christchurch .. ..	M. ..	13	18	10	16	15	4	76
	F. ..	5	11	8	17	17	6	64
	Totals	18	29	18	33	32	10	140

*Table III—All Cases, Health Districts, by Sex and Age Groups—  
continued*

Health District	Sex	Age Group						Totals
		0-4	5-9	10-14	15-24	25-34	35 and Over	
Timaru .. ..	M. ..	20	15	10	13	10	2	70
	F. ..	11	13	3	7	7	1	42
	Totals	31	28	13	20	17	3	112
Dunedin .. ..	M. ..	12	19	16	15	10	6	78
	F. ..	15	14	12	21	13	..	75
	Totals	27	33	28	36	23	6	153
Invercargill .. ..	M. ..	7	15	5	5	6	4	42
	F. ..	4	4	4	8	7	4	31
	Totals	11	19	9	13	13	8	73
New Zealand totals	M. ..	154	194	107	138	138	64	795
	F. ..	116	126	76	172	163	37	690
	Totals	270	320	183	310	301	101	1,485

Table IV—Paralysed Cases by Sex and Age Groups

Health District	Sex	Age Group						Totals
		0-4	5-9	10-14	15-24	25-34	35 and Over	
Whangarei .. ..	M. ..	2	..	2	2	2	1	9
	F. ..	1	1	1	4	3	1	11
	Totals	3	1	3	6	5	2	20
Auckland .. ..	M. ..	4	11	5	12	8	4	44
	F. ..	4	9	1	15	8	1	38
	Totals	8	20	6	27	16	5	82
Hamilton .. ..	M. ..	6	5	1	4	4	3	23
	F. ..	5	2	2	6	4	1	20
	Totals	11	7	3	10	8	4	43
Tauranga .. ..	M. ..	1	3	1	2	6	5	18
	F. ..	..	1	2	4	9	2	18
	Totals	1	4	3	6	15	7	36
Gisborne .. ..	M. ..	7	4	1	3	4	3	22
	F. ..	5	6	3	3	6	..	23
	Totals	12	10	4	6	10	3	45
New Plymouth .. ..	M. ..	17	12	5	6	10	7	57
	F. ..	12	10	4	7	4	4	41
	Totals	29	22	9	13	14	11	98
Palmerston North .. ..	M. ..	14	11	2	9	8	5	49
	F. ..	10	13	4	14	15	3	59
	Totals	24	24	6	23	23	8	108
Wellington .. ..	M. ..	13	1	1	9	17	5	46
	F. ..	11	3	2	9	19	1	45
	Totals	24	4	3	18	36	6	91
Nelson .. ..	M. ..	7	7	1	5	3	5	28
	F. ..	2	5	3	5	10	3	28
	Totals	9	12	4	10	13	8	56
Greymouth .. ..	M. ..	2	2	..	2	..	1	7
	F. ..	3	3	1	3	2	..	12
	Totals	5	5	1	5	2	1	19
Christchurch .. ..	M. ..	8	12	6	9	8	4	47
	F. ..	4	4	4	10	12	3	37
	Totals	12	16	10	19	20	7	84

*Table IV—Paralysed Cases by Sex and Age Groups—continued*

Health District	Sex	Age Group						Totals
		0-4	5-9	10-14	15-24	25-34	35 and Over	
Timaru .. ..	M. ..	9	5	9	9	7	2	41
	F. ..	7	12	3	4	5	..	31
	Totals	16	17	12	13	12	2	72
Dunedin .. ..	M. ..	9	9	12	10	10	6	56
	F. ..	12	10	10	14	12	..	58
	Totals	21	19	22	24	22	6	114
Invercargill .. ..	M. ..	4	11	5	4	5	3	32
	F. ..	3	4	4	7	4	3	25
	Totals	7	15	9	11	9	6	57
New Zealand totals	M. ..	103	93	51	86	92	54	479
	F. ..	79	83	44	105	113	22	446
	Totals	182	176	95	191	205	76	925

Table V—Deaths by Sex and Age Groups

Health District	Sex	Age Group						Totals
		0-4	5-9	10-14	15-24	25-34	35 and Over	
Whangarei ..	F. ..	..	..	..	..	1	..	1
Auckland ..	M. ..	..	..	..	2	1	..	3
	F. ..	..	..	..	1	..	..	1
	Totals	..	..	..	3	1	..	4
Hamilton ..	F. ..	..	..	..	..	1	..	1
Tauranga ..	M. ..	..	..	..	..	1	1	2
	F. ..	..	..	..	..	2	..	2
	Totals	..	..	..	..	3	1	4
Gisborne ..	M. ..	..	..	..	..	2	1	3
New Plymouth ..	M. ..	1	..	1	3	1	2	8
	F. ..	..	..	..	1	..	..	1
	Totals	1	..	1	4	1	2	9
Palmerston North ..	M. ..	..	2	..	..	1	2	5
	F. ..	..	..	1	..	2	..	3
	Totals	..	2	1	..	3	2	8
Wellington ..	M. ..	..	..	..	..	2	..	2
	F. ..	1	1	..	..	..	..	2
	Totals	1	1	..	..	2	..	4
Nelson ..	M. ..	1	1	..	1	..	1	4
	F. ..	..	..	..	1	..	2	3
	Totals	1	1	..	2	..	3	7
Greymouth ..	M. ..	1	..	..	..	..	1	2
Christchurch ..	M. ..	..	1	1	1	1	1	5
	F. ..	..	..	..	1	..	..	1
	Totals	..	1	1	2	1	1	6
Timaru ..	M. ..	1	..	..	2	1	1	5
	F. ..	1	..	2	..	..	..	3
	Totals	2	..	2	2	1	1	8
Dunedin ..	M. ..	..	..	..	..	2	..	2
	F. ..	1	..	1	1	1	..	4
	Totals	1	..	1	1	3	..	6
Invercargill ..	M. ..	..	..	2	2	1	2	7
	F. ..	..	..	..	..	1	2	3
	Totals	..	..	2	2	2	4	10
New Zealand totals	M. ..	4	4	4	11	13	12	48
	F. ..	3	1	4	5	8	4	25
	Totals	7	5	8	16	21	16	73

The next table shows the total incidence, paralysed cases, deaths, and case-fatality rates by age groups for the whole of New Zealand.

*Table VI—All Cases, Paralysed Cases, Deaths, and Case-fatality Rates, by Age Groups*

Age Group	Population	All Cases		Paralysed Cases		Deaths		Fatality Rates (Deaths per 100 Cases)
		Number	Rate per 10,000 Population	Number	Rate per 10,000 Population	Number	Rate per 10,000 Population	
0-4 ..	256,548	270	10.52	182	7.09	7	0.27	2.59
5-9 ..	240,583	320	13.30	176	7.32	5	0.21	1.56
10-14 ..	186,127	183	9.83	95	5.10	8	0.43	4.37
15-24 ..	291,316	310	10.64	191	6.56	16	0.55	5.16
25-34 ..	306,815	301	9.81	205	6.68	21	0.68	6.98
35 and over ..	892,673	101	1.13	76	0.85	16	0.18	15.84
Total, all ages	2,174,062	1,485	6.83	925	4.25	73	0.34	4.92

Although there has been a tendency in recent epidemics for the attack rate to increase in the adult ages, the highest rate is still recorded for the five to nine age group. The rate for all children under 15 of 11.31 per 10,000 population was over twice as high as that for all persons over 15 (4.78). Measured by the severity of the attack the incidence rates are more evenly spread, as will be seen from the above table. For paralysed cases the highest incidence was still recorded for the age group five to nine, but the older age groups, other than 35 and over recorded rates very little below this group. It would appear that the older the patient the greater the chance of death ensuing. This is particularly true as regards the case-fatality rate.

#### Cases Treated at Home and Use of Mechanical Respirators

The next three tables, which give figures of the number of cases treated at home and certain details relating to the use of mechanical respirators, are included as a matter of record.

*Table VI—Cases Treated at Home*

Health District		Number of Cases	Percentage of Total Cases
Whangarei ..	..	7	21.2
Auckland ..	..	14	9.3
Hamilton ..	..	6	9.1
Tauranga ..	..	20	29.4
Gisborne ..	..	6	8.6
New Plymouth ..	..	20	14.2
Palmerston North ..	..	15	9.4
Wellington ..	..	6	3.5
Nelson ..	..	2	1.6
Greymouth ..	..	..	..
Christchurch ..	..	26	18.6
Timaru ..	..	4	3.6
Dunedin ..	..	13	8.5
Invercargill ..	..	5	6.8
Totals ..	..	144	9.7

*Table VII—Cases Where Mechanical Respirator Used*

Health District	Total Cases	Deaths
Whangarei .. ..	..	..
Auckland .. ..	7	2
Hamilton .. ..	2	..
Tauranga .. ..	3	3
Gisborne .. ..	5	3
New Plymouth .. ..	12	8
Palmerston North .. ..	11	6
Wellington .. ..	6	4
Nelson .. ..	8	5
Greymouth .. ..	2	2
Christchurch .. ..	8	6
Timaru .. ..	9	5
Dunedin .. ..	10	6
Invercargill .. ..	8	6
<b>Totals .. ..</b>	<b>91</b>	<b>56</b>

*Table VIII—Cases Where Mechanical Respirator Used, by Sex and Age Groups*

Age Group	Males	Females	Total	Deaths
0-4 .. .. ..	7	3	10	7
5-9 .. .. ..	5	6	11	4
10-14 .. .. ..	4	4	8	5
15-24 .. .. ..	12	3	15	11
25-34 .. .. ..	16	10	26	15
35 and over .. .. ..	17	4	21	14
<b>Totals .. ..</b>	<b>61</b>	<b>30</b>	<b>91</b>	<b>56</b>

Slightly fewer cases were treated at home in the 1955-56 epidemic (9·7 per cent), as compared with the 1952-53 (10·4 per cent).

Mechanical respirators were in use in considerably more cases, possibly the availability of these machines being a factor in the changed proportion. In 1955-56 a total of 91 patients were treated in mechanical respirators (6·1 per cent). In 1952-53 there were 46 cases so treated (3·5 per cent). The deaths of these patients were 56 and 36 respectively, amounting to 61·5 and 78·5 per cent respectively.

### Severity and Extent of Paralysis

The severity of the paralysis is shown in Table IX. The assessment was made in each case by the clinician in charge of the patient.

*Table IX—All Cases, Severity of Paralysis*

Age Group		None	Slight	Moderate	Severe	Totals
0-4	..	88	70	64	48	270
5-9	..	144	74	65	37	320
10-14	..	88	47	18	30	183
15-24	..	118	67	72	53	310
25-34	..	97	59	70	75	301
35 and over	..	25	18	28	30	101
Totals	..	560	335	317	273	1,485

The next table shows the severity of the paralysis at the time of leaving hospital. All cases that had not been treated in hospital, who had never had paralysis, or who died in hospital have been excluded from the table. Patients still in hospital at the time the statistical returns were made out have had the severity assessed at three months after the onset of paralysis.

*Table X—All Paralysis Cases Treated in Hospital. Severity of Paralysis on Leaving Hospital (Excluding Deaths)*

Age Group	None		Slight		Moderate		Severe		Unknown		Totals	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent		
0-4	..	23	14·9	76	49·0	38	24·5	18	11·6	..	..	155
5-9	..	32	20·7	71	45·8	47	30·3	4	2·6	1	0·6	155
10-14	..	22	28·5	31	40·3	15	19·5	8	10·4	1	1·3	77
15-24	..	32	20·1	61	38·4	43	27·0	23	14·5	..	..	159
25-34	..	22	13·0	62	36·7	52	30·8	31	18·3	2	1·2	169
35 and over	..	10	18·5	22	40·7	15	27·8	7	13·0	..	..	54
Totals	..	141	18·4	323	42·0	210	27·3	91	11·8	4	0·5	769

It will be seen that by the end of their treatment in hospital 18·4 per cent of all paralysis cases hospitalised (excluding deaths) had no paralysis, while a further 42 per cent had only slight paralysis. The best results appear to have been obtained in the 10-14 age group, where 28·5 per cent had no paralysis and 40·3 per cent were still slightly affected. The age group suffering most in respect of severity of the disease was 25-34. In this group only 13·0 per cent had no paralysis on discharge from hospital. The proportion with slight paralysis was also the smallest of all age groups (36·7), while these ages had the highest proportion with severe paralysis still present (18·3 per cent).

### Urban and Rural Incidence

The epidemic was more widespread in rural areas than in urban areas. In actual number the urban areas contributed more to the total number of cases, viz., all urban areas 873, or 58·8 per cent, of which 601, or 40·5 per cent, occurred in the large metropolitan areas and 272, or 18·3 per cent, in the smaller urban areas. A total of 612, or 41·2 per cent, of the total cases were resident in rural districts.

In proportion to population the main urban areas had a rate of 5·0 per 10,000; smaller urban areas 8·5; all urban areas 5·8; and country districts 9·3; nearly double the incidence rate of the urban areas.

Of the total of 1,485 cases, 37·7 per cent had no paralysis at the time of diagnosis, in 22·6 per cent the paralysis was slight, in 21·3 per cent it was moderate, and a further 18·4 per cent of cases had severe paralysis. As might be expected the proportion of severe cases increased with age. It is interesting to record that in the 1952–53 epidemic only 15·7 per cent had severe paralysis, while 42·1 per cent had no paralysis. Of the 73 deaths in 1955–56 only eight cases were recorded where the paralysis was not severe.

The extent of paralysis at its maximum in the 925 paralysed patients and its localisation on discharge from hospital or death is shown in Tables X and XI. Table XII shows the extent of paralysis in the 73 fatal cases.

*Table XI—All Cases, Location of Paralysis at Maximum*

Age Group	0	1	2	3	4	5	6	7	9	Totals
0–4 ..	88	12	20	120	3	22	1	4	..	270
5–9 ..	144	14	22	97	3	35	1	3	1	320
10–14 ..	88	14	19	37	3	19	..	3	..	183
15–24 ..	118	14	28	83	5	52	4	6	..	310
25–29 ..	97	16	28	84	9	55	2	10	..	301
35 and over ..	25	6	12	29	6	17	1	5	..	101
Totals ..	560	76	129	450	29	200	9	31	1	1,485

*Table XII—All Cases, Location of Paralysis on Leaving Hospital*

Age Group	0	1	2	3	4	5	6	7	8	9	Totals
0–4 ..	116	8	21	105	..	14	1	2	..	3	270
5–9 ..	183	10	21	77	..	23	1	2	..	3	320
10–14 ..	116	7	18	23	1	13	..	2	1	2	183
15–24 ..	160	11	19	73	4	35	2	4	..	2	310
25–34 ..	125	12	23	83	8	36	1	8	4	1	301
35 and over ..	37	7	9	24	4	14	1	5	..	..	101
Totals ..	737	55	111	385	17	135	6	23	5	11	1,485

Table XIII—Deaths, Location of Paralysis at Maximum

Age Group	0	1	2	3	4	5	6	7	Totals
0-4 ..	..	2	..	2	..	1	..	2	7
5-9 ..	..	1	..	1	..	1	..	2	5
10-14 ..	..	3	1	..	..	2	..	2	8
15-24 ..	..	6	..	1	3	2	1	3	16
25-34 ..	..	1	3	..	1	6	2	7	21
35 and over ..	..	2	1	2	3	4	..	4	16
Totals ..	1	17	2	7	12	12	2	20	73

The key to the location of the paralysis in these three tables is as follows:

#### Key to Tables XI to XIII

0 = None.

1 = Cerebral, bulbar.

2 = Upper cervical, lower cervical.

3 = Thoracic, lumbar or sacral.

4 = 1 + 2.

5 = 2 + 3.

6 = 1 + 3.

7 = 1 + 2 + 3.

8 = Still in hospital.

9 = Not stated or unknown.

Tables XIV, XV, XVI, XVII, and XVIII, give particulars of the time of onset of fever and paralysis and, for the fatal cases, the time elapsing between onset of illness and removal to hospital and the time spent in hospital before death.

Table XIV—All cases, Time Between Illness and Onset of Fever

Age Group	Number of Days												
	0	1	2	3	4	5	6	7	8	9*	N.K.	None	Totals
0-4 ..	149	24	9	12	7	6	7	1	3	3	35	13	270
5-9 ..	171	39	21	13	9	6	3	10	3	3	33	9	320
10-14 ..	81	29	21	8	4	3	2	1	2	1	18	13	183
15-24 ..	133	58	22	16	9	7	6	2	2	4	26	25	310
25-34 ..	140	31	23	15	16	5	11	3	3	31	23	301	
35 and over ..	48	5	5	8	6	2	2	2	1	2	14	6	101
Totals ..	722	187	101	72	51	29	31	19	11	16	157	89	1,485

*Table XV—All Paralysed Cases: Time Between Illness and Onset of Paralysis*

Age Group	Number of Days																N.S.	Total
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15*		
0-4 ..	16	27	25	21	20	11	9	13	2	3	5	2	4	3	1	3	17	182
5-9 ..	12	19	19	26	15	8	13	14	3	8	4	2	2	1	1	8	21	176
10-14 ..	8	7	15	6	16	6	6	2	4	1	3	..	1	1	..	4	15	95
15-24 ..	12	24	36	18	29	11	4	16	3	6	10	4	1	1	1	4	11	191
25-34 ..	17	20	23	31	29	14	10	15	6	2	4	4	2	1	1	9	17	205
35 and over ..	10	6	11	11	6	5	7	1	4	6	2	1	..	..	1	1	4	76
Totals ..	75	103	129	113	115	55	49	61	22	26	28	13	10	7	5	29	85	925

*Table XVI—Deaths. Time Between Illness and Onset of Paralysis*

Age Group	Number of Days																N.S.	Totals
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15*		
0-4 ..	..	..	1	1	3	..	1	..	..	..	1	..	..	..	..	..	..	7
5-9 ..	..	1	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	5
10-14 ..	..	2	..	1	2	..	1	..	..	..	..	..	..	..	..	..	..	2
15-24 ..	1	3	5	2	2	..	..	..	..	..	1	1	..	..	1	..	..	16
25-34 ..	2	2	5	2	3	1	2	1	..	..	1	1	..	..	..	..	..	20
35 and over ..	2	3	3	2	1	..	..	1	..	1	..	1	..	..	..	..	2	16
Totals ..	5	11	14	12	11	1	4	2	..	1	3	3	..	..	1	..	4	72*

*Table XVII—Deaths. Time Between Illness and Removal to Hospital*

Age Group	Number of Days																N.S.	Totals
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15*		
0-4 ..	..	..	1	2	1	2	..	..	..	..	1	..	..	..	..	..	..	7
5-9 ..	..	1	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	5
10-14 ..	..	2	..	2	1	1	1	..	..	..	..	..	..	..	..	..	..	8
15-24 ..	1	3	4	2	3	..	..	..	..	1	1	1	..	..	..	..	..	16
25-34 ..	2	2	2	2	5	3	3	..	..	..	..	2	..	..	..	..	..	21
35 and over ..	..	1	3	6	1	2	..	1	1	1	..	..	..	..	..	..	..	16
Totals ..	3	9	13	15	11	8	4	2	1	2	2	3	..	..	..	..	..	73

\* One death with no paralysis.

*Table XVIII—Deaths: Time Between Admission to Hospital and Death*

Age Group		Under 1 Week	1 Week	2 Weeks	3-6 Weeks	6-8 Weeks	2 Months	3-5 Months	Totals
0-4 ..	..	..	5	..	..	1	..	..	7
5-9 ..	..	..	5	..	..	..	..	..	5
10-14 ..	..	..	5	2	..	..	..	1	8
15-24 ..	..	..	12	2	1	..	..	1	16
25-34 ..	..	..	15	4	..	1	1	..	21
35 and over ..	..	..	10	5	..	..	1	..	16
Totals ..	..	..	52	13	1	2	1	3	73

### Comparison Between Major Epidemics in New Zealand

Very little information is available regarding the 1916 and 1925 epidemics, except that they were short and intense and each lasted some six or seven months with a monthly incidence rising as high as 320 and 366. The 1937 epidemic was rather more prolonged, with a relatively high incidence for eight months and a more gradual return to normal. In 1947–49 the outbreak was less intense and was spread over some 20 months with the highest monthly total of 117 cases. The spread of infection throughout the country was very slow and the disease took about 12 months to spread from Auckland to Dunedin. The epidemic of 1952–53 was more similar to earlier outbreaks, lasting some 11 months with the monthly incidence rising to 209, or nearly double the highest monthly incidence of 1947–49. The latest epidemic of 1955–56 had a duration of 12 months, remained fairly intense for six months, and reached a highest monthly incidence of 277. One peculiarity was the fairly severe outbreak in Dunedin for three months before it really spread to the South Island as a whole.

In the next tables a comparison is given of certain features of the various epidemics by age groups. It is not possible to compare the same age groups all through as this information has not always been available.

*Table XIX—Percentage of Cases by Age Groups (All Cases)*

Age Group	1916	1925	1937	1947–49	1952–53	1955–56
0–4 ..	61·3	55·2	27·3	21·2	17·9	18·2
5–9 ..	17·5	23·5	23·5	29·5	20·6	21·6
10–14 ..	8·2	10·0	19·8	17·7	16·6	12·3
15–19 ..	6·3	5·5	8·8	9·4	10·5	11·6
20 and over ..	6·7	5·8	11·3	20·4	31·6	36·3
Totals ..	100·0	100·0	100·0	100·0	100·0	100·0

The shifting of the age-group incidence to the group containing adults is clearly seen from the above figures. This is further seen in Table XX, which shows the attack rate in the same age groups.

*Table XX—Attack Rates by Age Groups (All Cases)*  
(Rates per 10,000 of population)

Age Group	1916	1925	1937	1947–49	1952–53	1955–56
0–4 ..	43·1	51·1	18·7	13·8	9·8	10·5
5–9 ..	15·8	21·9	20·7	24·5	13·8	13·3
10–14 ..	7·6	8·9	12·2	18·4	13·1	9·8
15–19 ..	4·8	5·3	5·6	9·7	10·0	4·2
20 and over ..	1·2	0·8	1·0	2·6	3·4	4·8
Totals ..	9·4	9·7	5·9	7·7	6·6	6·8

The incidence of paralysed cases is shown in Table XXI for each of the last four epidemics.

*Table XXI—Paralysed Cases: Numbers and Rates*

Age Group	1937		1947–49		1952–53		1955–56	
	Number	Rate per 10,000 Population	Number	Rate per 10,000 Population	Number	Rate per 10,000 Population	Number	Rate per 10,000 Population
0–4 ..	205	15·0	185	8·8	173	7·3	182	7·1
5–9 ..	195	14·0	212	12·6	125	6·5	176	7·3
10–14 ..	118	8·1	117	8·7	98	6·0	95	5·1
15–24 ..	97	3·4	166	6·0	154	5·7	191	6·6
25–34 ..	{ 41	0·4	83 } 125	1·2	123 } 202	4·3 } 1·8	205 } 281	6·7 } 2·3
35 and over ..			42 }		79 }	1·0 }	76 }	0·9 }
Totals ..	656	4·1	805	4·4	752	..	925	4·3

Here again the transference of the incidence of paralysed cases gradually from the younger to the older age groups is apparent. In Table XXII the death rates are compared for all six epidemics.

*Table XXII—Death Rates per 10,000 of Population*

Age Group	1916*	1925*	1937	1947–49	1952–53	1955–56
0–4 ..	3·94	5·64	0·3	0·33	0·34	0·27
5–9 ..	1·22	3·87	0·5	0·59	0·47	0·21
10–14 ..	0·91	1·34	0·4	0·59	0·73	0·43
15–24 ..	1·72	0·78	0·4	0·86	0·74	0·55
25–34 ..	0·76 } 0·31	0·25 } 0·12	0·2	0·3 } 0·67 } 0·27	0·68 } 0·15 } 0·18	0·31
35 and over ..	0·07 }	0·08 }				
Totals ..	1·2	1·3	0·3	0·4	0·4	0·3

\* Excluding Maoris, figures for whom are not available.

The movement is not so apparent in the death-rate figures, as on the whole very small numbers are involved in each age group.

Table XXIII—Case-fatality Rates: Deaths per Cent of Total Cases

Age Group	1925			1937			1947-49			1952-53			1955-56		
	Cases	Deaths	Fatality Rate	Cases	Deaths	Fatality Rate	Cases	Deaths	Fatality Rate	Cases	Deaths	Fatality Rate	Cases	Deaths	Fatality Rate
0-4 ..	641	77	12·0	245	4	1·6	298	7	2·4	233	8	3·4	270	7	2·6
5-9 ..	273	51	18·9	291	7	2·4	416	10	2·4	266	9	3·4	320	5	1·6
10-14 ..	115	18	15·6	177	6	3·3	248	8	3·2	215	12	5·6	183	8	4·4
15-24 ..	83	18	22·5	129	12	9·3	253	24	9·5	276	20	7·2	310	16	5·2
25 and over ..	47	9	19·1	54	17	31·4	191	28	14·6	308	31	10·0	402	37	9·2
Totals ..	1,159	173	14·9	896	46	5·1	1,406	77	5·5	1,298	80	6·1	1,485	73	4·9

Since 1925 the general incidence of poliomyelitis has definitely shifted to the older age groups. Subsequent to the 1937 epidemic there has been little significant change in the case-fatality rate, except that there is a noticeable decline in the rate at the older age groups.

In earlier epidemics the attack rate was highest in the 0-4 age group but in the last four outbreaks the 5-9 age group had the highest attack rate.

#### References

- <sup>1</sup> Report of Director-General of Health, 1950.  
<sup>2</sup> Maclean, F. S. (1955) : *N.Z. Med. Journal*, 421.

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